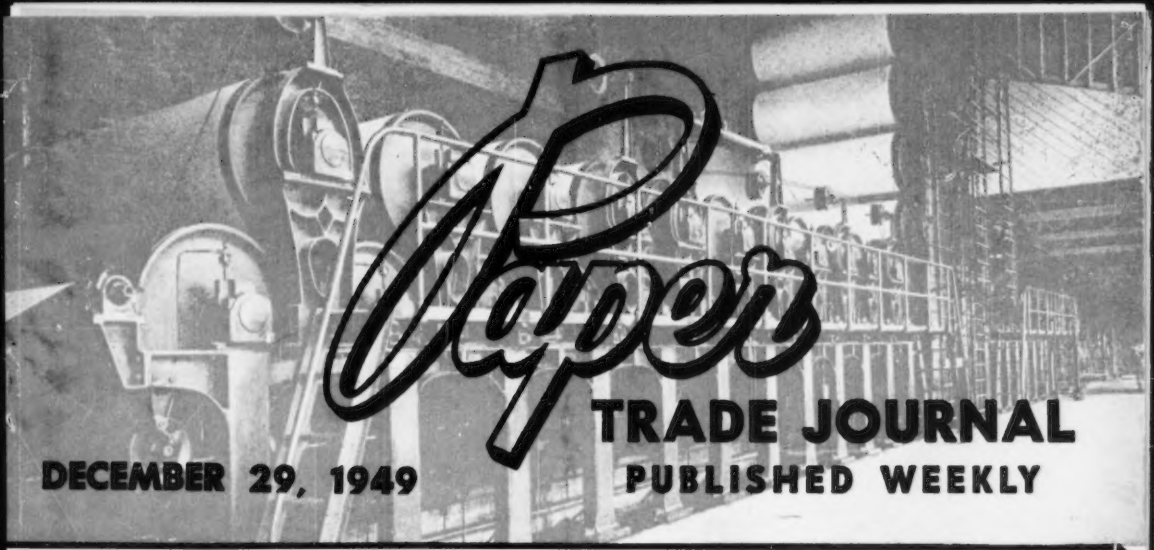


Paper TRADE JOURNAL

DECEMBER 29, 1949

PUBLISHED WEEKLY

Season's Greetings

Old friendships based on years of mutual understanding and confidence are a continuing incentive to increased service. Together with the new friendships achieved during the year now ending, they are the foundation of all we hope to enjoy in the coming year. To all our friends, a very

HAPPY NEW YEAR

GOTTESMAN & COMPANY, Inc.

NO MORE EFFECT THAN A *Feather* ON THE ROCK OF GIBRALTAR.....

You can imagine what effect a feather would have in deflecting the Rock of Gibraltar. The rolls in a Downingtown Smoothing Press DO NOT HAVE ANY CROWN, yet comparatively they are as non-deflecting as the "Rock," under the feather. This means that no matter how much, or how little, you weight the roll at the ends, the nip pressure is always uniform across the entire sheet, regardless of sheet caliper, thus minimizing blowing, crushing and checking, etc.

Should you need a smoother sheet and a higher finish to meet today's competitive market, the Downingtown Smoothing Press must receive serious consideration, as it is a salient factor in the solution of your problem.

Downingtown Smoothing Press Rolls are mounted in anti-friction bearings and, when necessary, a rope carrier is provided to feed the sheet into the rolls.

May one of our engineers call to discuss the improvement of the quality of your sheet with a Downingtown Smoothing Press; also to explain how, without crown, uniform nip pressures are assured at all loadings. Write us.

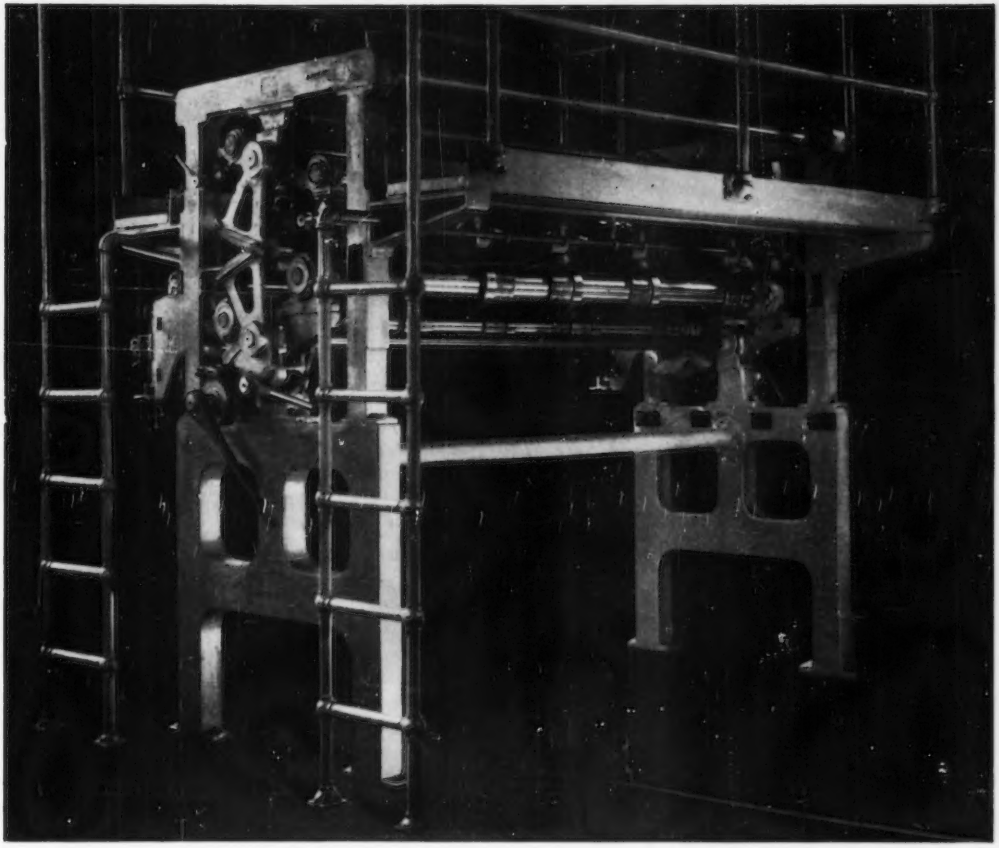
DOWNINGTOWN MANUFACTURING COMPANY

DOWNINGTOWN, PA.

DESIGNERS AND BUILDERS OF PAPER MAKING MACHINERY SINCE 1880

it's new–it's versatile–it's more efficient

Moore & White DUPLEX SLITTER



This slitter is built of box section frames, for hard continuous operation, and will efficiently handle 95 percent of the grades of paper and paperboard manufactured today. The unit can be operated with practically any type of sheeting equipment where fast change-over from one sheet-width to another is required. It eliminates shutdown time when changing sheet-width and also reduces waste due to resetting of slitters.

This unit, when combined with our new rotary sheet-cutters, permits continuous sheet operation. Changes of width and length of sizes are made without shutting down the combined units. The change-over from one slitter section to the other is fast, simple, and accurate.

Positive throwout of top slitter blades is accomplished through the use of a handle on each slitter section. One quarter-turn of the handle moves all blades in the section either in or out of normal operating position.

The slitter may be driven separately, from the sheet cutter, or direct from the paper machine line shaft. Each section is driven as a separate unit, complete with clutch to eliminate shock loads when change-over is made. All moving parts are encased in antifriction bearings.

The speed range of the new Moore & White Duplex Slitter will meet the needs of any sheeting equipment now in operation. It is built to standard widths of 50, 62, 72, 84, 110, and 124 inches. Additional widths are available in sizes to suit your requirements. Write today for complete information.

CUSTOM-BUILT MACHINES FOR MAKERS OF PAPER AND PAPERBOARD

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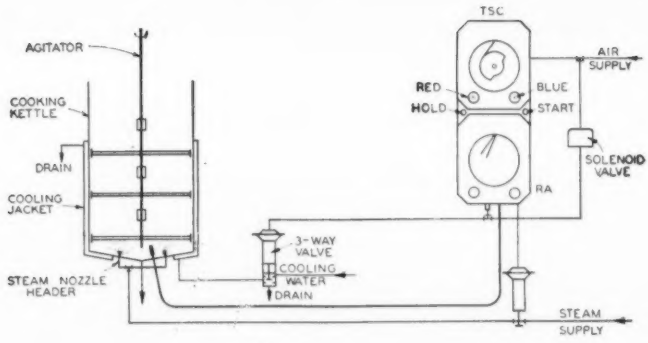

You can do a better paper coating job with TAYLOR AUTOMATIC CONTROL

PAPER COATING has to be handled at top efficiency and minimum cost to *meet and beat today's competition.* If you're using starch as a coating adhesive, Taylor Automatic Starch Cooking Control, masterminded by the famous Taylor Fulscope* Time Schedule Temperature Controller (left) can step in and really save you money.

IT CAN DO THIS IN FOUR WAYS:

1. *Automatically* assuring uniform temperature rise in starch to gelatinization temperature.

2. *Automatically* holding solution at conversion temperature for fixed period or until desired viscosity is reached.

3. *Automatically* heating solution *as rapidly as possible* to temperature which stops enzyme action.

4. *Automatically* holding solution at maximum temperature until there is no enzyme action.

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For the *whole* story on Taylor Automatic Starch Kettle Control for perfect paper coating, ask your Taylor Field Engineer. He'll be glad to explain this and the many other forms of cost-cutting Taylor Instrumentation for practically every phase of paper making. Specify "Taylor-Equipped, As Usual" when ordering processing equipment. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

*Registered Trade-Mark

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MEMBER
ABP ABC

DECEMBER 29, 1949

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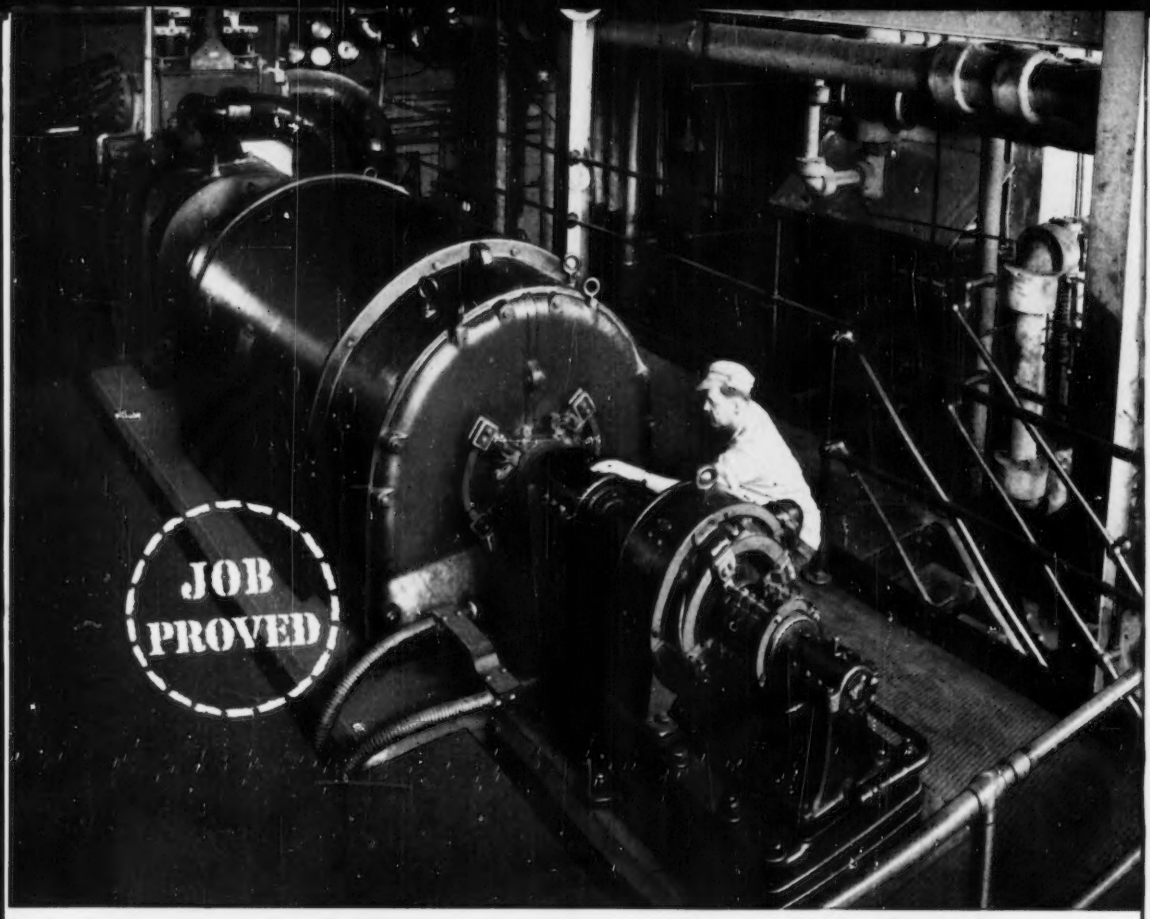

PROTECTED BY SUNVIS 916

Turbine Bearings and Journals Corrosion-Free Despite Summer Shutdowns — Oils Like New After 9,000 Hours

Three years ago, a paper mill overhauled a steam turbine. Thereafter, it was planned to operate this equipment on a 'round-the-clock schedule during the six winter months, and completely shut down in the summer. On the advice of a Sun Engineer, the mill charged the circulating system supplying turbine, generator journals, and governor with Sunvis 916. This oil was chosen because of its "Job Proved" ability to prevent rust and corrosion and to give troublefree lubrication for a long period of time.

The management's selection of Sunvis 916 proved to be sound. After 9,000 hours, a laboratory analysis of the oil showed it to be unchanged—comparable to a sample of new oil. Even more important, inspection showed no abnormal wear and no corrosion in bearings and journals, despite the summer-long shutdown.

The turbine has now operated 12,000 hours without oil-change, and it appears that none will be necessary in the foreseeable future.

All oils in the Sunvis 900 series have a high viscosity index, are fortified against oxidation and sludging, and prevent rust and corrosion. Sunvis 900 Oils are the finest lubricants available for turbines, hydraulic systems, and similar applications. For a free, illustrated booklet on Sunvis 900 Oils, write Department PT-12.

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Paper TRADE JOURNAL

TRENDS

Office of the PAPER TRADE JOURNAL,
Wednesday, December 28, 1949.

Container-Packaging Outlook
Part 2

Paralleling the vastly improved picture with respect to paper and paperboard production (refer to Production Indexes on this page), manufacturers of paper and paperboard containers increased their output during the third quarter. Outlook for the balance of 1949 and for 1950 is viewed with considerably more optimism than a few months ago, the Office of Domestic Commerce reports.

Corrugated and Solid Fiber Shipping Containers.—Demand for shipping containers showed a steady increase throughout the third quarter. Prices in fiber and corrugated boxes firmed and are at present fairly well stabilized.

Folding Boxes. — Demand increased steadily during the third quarter. (See Table A.) If, as has occurred in other paper and paperboard container industries, box-plant inventories of raw materials have been reduced during the third quarter, actual shipments of folding paper boxes for 1949 may approximate the 1948 industry totals.

Set-Up Boxes. — Demand for set-up boxes continued stronger than most industry sources had believed possible. (See Table B.) Christmas volume for 1949 is expected to equal or exceed 1948 levels. A healthy outlook for the fourth quarter and 1950 now prevails.

Paper Shipping Sacks. — ODC field office survey indicates that shipments of paper shipping sacks did not decline to the same degree as production of shipping sack paper. This fact led to the assumption that paper shipping sack manufacturers have effected substantial reductions in raw material inventories, and that demand would take the sharp upward swing noted in the fourth quarter.

Table A
PRODUCTION FOLDING BOXBOARD, 1948-49
(In Short Tons)

Month	1948	1949	% Change
July	152,116	124,731	—18.1
August	175,927	175,866	0
September	179,445	181,000	— 0.8
Total third quarter	307,488	481,597	— 5.2
Total first 9 mos.	1,591,773	1,487,874	— 6.6

Table B
PRODUCTION SET-UP BOXBOARD, 1948-49
(In Short Tons)

Month	1948	1949	% Change
July	38,179	31,789	—16.8
August	48,845	54,079	+10.7
September	51,347	61,000	+18.7
Total third quarter	138,371	146,868	+ 5.4
Total first 9 mos.	446,290	422,479	— 5.4

Paper Bags.—Production of bag paper, including grocery and variety bag paper declined 16.8 percent from 1948's period. Total 1949 production through September was 1.2 percent under comparable months of 1948. Although actual data are not yet available, some producers report order backlogs on kraft paper bags as high as 190 days, with sales volume during the quarter equaling the 1948 quarter. Plant quotations, reported firm by ODC field offices, are being subjected to a new round of price reductions as a reaction to increased jobber competition.

• *Other Selected Paper Containers.*—Demand for practically all other types of paper containers continued high in most areas of the country. Producers of paper containers for frozen foods were generally reported to have increased both quality and output. Third quarter production or paper cups and nested food containers was reported steady. One company reported production close to capacity on nearly all items, with one item on an allotment basis.

New developments, such as larger size containers for meats, cheese and

(Continued on page 12)

Production Indexes

Ratio of production of unbleached kraft paper to potential mill capacity for that product was 93.7 percent for the week ended December 17, compared with 91.4 for the preceding week, and with 92.4 for the corresponding week of last year.

Comparative ratios of U. S. paper and paperboard production to mill capacity, as reported by AP&PA, are:

	Dec. 17 1949	Dec. 10 1949	Dec. 18 1948	Dec. 20 1947	Dec. 21 1946
Paper	98.0	‡100.5	96.1	107.2	101.8
Paperboard	92.0	96.0	96.0	100.0	102.0

‡ Revised.

Paperboard Production (Tons)*

	Dec. 17 1949	Dec. 10 1949	Dec. 18 1948
Production	204,204	210,286	194,508
New Orders	167,383	203,493	155,499
Unfilled Orders	377,366	421,532	324,804

* Source: NPA.

General Business Indexes

Index of general business activity for the week ended December 17 declined to 151.5 from 152.2 in the preceding week, compared with 155.4 in the corresponding week of 1948. Index of paperboard production fell to 205.1 from 215.1 in the preceding week, compared with 195.1 in the corresponding week of 1948.

ESTIMATED PRODUCTION OF CONTAINERS
[Index: 1940=100]

Type of container		1940	1944	1947	1948[5]	1949[6]
Consumer type containers:						
Metal cans	thous. tons steel	2,191	2,074	2,956	3,247	3,200
Glass containers	thous. gross	52,116	99,727	115,300	98,721	88,000
Paper milk bottles	tons[3]	n.a.	66,596	115,188	162,333	175,000
Hood and lid cover stock	tons[3]	n.a.	18,155	16,074	16,745	17,000
Liquid tight containers	tons[3]	n.a.	42,721	38,428	24,470	24,000
Cups and rd. nested food containers	tons[3]	n.a.	84,437	[4]114,535	76,928	75,000
Ice cream, frozen food and butter contr. stock	tons[3]	n.a.	124,677	163,051	162,608	160,000
Milk bottle plug caps	tons[3]	n.a.	25,904	19,937	21,802	22,500
Folding boxes	thous. tons	1,398	1,730	2,257	2,182	2,000
Set-up boxes	thous. tons	615	750	595	596	550
Fibre cans and tubes	thous. tons[3]	n.a.	458	[4]183	[4]243	*225
Paper bags, includ. grocery and variety	thous. tons	606	375	[5]553	728	660
Shipping containers:						
Steel drums and pails	thous. tons steel	572	863	920	918	825
Baskets and hampers	mil. sq ft. veneer	1,529	1,000	1,074	n.a.	n.a.
Nailed wood boxes	mil. board feet	4,295	11,500	5,040	4,500	3,800
Wirebound boxes	thous. units	78,175	139,500	126,670	124,213	110,000
Metal strapping	thous. tons steel	100	315	310	390	370
Corrugated and solid fibre ship. contrs.	thous. tons	3,114	4,143	[4]4,758	4,898	4,700
Fibre drums	thous. units	3,500	14,500	17,400	18,000	17,500
Paper shipping sacks	thous. tons	195	392	671	617	500

n.a.—Not available. [1] Index: 1941 = 100. [2] Index: 1942 = 100. [3] Index: 1944 = 100. [4] Includes some fibre drum stock. [5] Revised. [6] Preliminary.
Source: Estimates based upon data supplied by Census Bureau, other Government Agencies, trade associations, trade journals, and industry representatives.

Paper TRADE JOURNAL

News of the Week

Plan Mill for Central City, Pa.

A large paper mill and a freight terminal are to be constructed near Central City on a five-acre plot that a Wilkes-Barre realtor purchased from the City for $150, it was revealed yesterday.

The plot is situated along Silex street, and is bounded by the Lackawanna River, the D & H Railroad and the Lackawanna Railroad's old Diamond Mine spur.

Harry Goldberg, the Wilkes-Barre real estate man who purchased the plot for New York interests, said that the paper mill to be erected will give employment to approximately 100 men.

This plant will be erected on part of the land and Freedman's Express will construct a freight terminal on another portion.

Mr. Goldberg has been dickering to obtain the land for some time. He was the sole bidder when the plot was offered for sale Wednesday in Mayor James T. Hanlon's office.

The realtor declined to identify the owners of the paper mill. He added, however, that they plan to manufacture cartons, boxes of all description and tissues.

He also declined to say the type of building to be constructed, and how much land it will occupy. He declared that he will complete negotiations the forepart of next week on a trip to New York.

The Freedman's Express depot, Mr. Goldberg said, will relieve pressure on the Wilkes-Barre terminal of the same firm. At present, he said, freight is hauled in and deposited at Wilkes-Barre, then is brought to the Scranton branch, presently at Jefferson avenue and Poplar street, for distribution through Northeastern Pennsylvania.

The Freedman firm is to erect a terminal building suitable to handle most of his freight designated for this region, Mr. Goldberg added. The shipments would be trucked to Scranton via the Scranton-Pocono Highway, unloaded at the new Silex street depot, then made ready for final distribution.

This new terminal, he explained, would provide jobs for between 30 and 40 men who would be paid between $70 and $80 a week.

John D. Cowan Elected Vice President

NEW YORK — John D. Cowan, who started with the firm as a chemist in 1929, was elected a vice-president of West Virginia Pulp & Paper Co. on December 21.

The new vice-president has had broad experience in the company, having served in eight different positions since joining the staff more than 20 years ago. He is 43 years old. Since January Mr. Cowan has been in the New York office on special assignment in connection with technical and economic aspects of various operating problems. Before that he spent more than 12 years on the staff of the company's Charleston, S. C., plant, where for four years he was assistant manager in charge of operations.

JOHN D. COWAN

He came to the paper company directly from Penn State in June, 1929, as a chemist in the laboratory of the Luke, Md., plant. He was named pulp mill assistant at Luke in November, 1930, and six years later was appointed assistant superintendent of the pulp mill. In January, 1937, he was transferred to Charleston, S. C., where the company was building a new kraft mill and when the plant began operations six months later he was appointed pulp mill superintendent. Mr. Cowan was advanced to general superintendent of the Charleston plant in June, 1941, and served in that capacity for four years before being advanced to the assistant managership.

Fowler Reviews Near Record Pace

MONTREAL—Canada's pulp and paper industry, the country's "greatest breadwinner," turned out products at a near-record pace in 1949 despite a leveling off of supply and demand, R. M. Fowler, president of the Canadian Pulp & Paper Ass'n., said here recently.

Mr. Fowler, also president of the Newsprint Ass'n. of Canada, said in a year-end review that in 1949, for the first time since the war, the output of pulp, newsprint, paper and paperboard equaled the "effective demand on Canadian mills."

"This change in the relationship between supply and demand would represent a return to normality but for the paradox that it has been accompanied by no ebb in the real demand for pulp and paper throughout the world.

"In fact, the world demand, as opposed to the restricted demand brought about by the dislocation of world trade and its symptoms, including currency problems, quotas, and the unbalanced international payments, still appears to be increasing."

Acting as spokesman for the $1 billion industry which produces more than 20 percent of Canada's total exports, Mr. Fowler noted the dollar shortage had limited the dominion's sales in many traditional pulp-and-paper markets. The dollar area, however, had largely absorbed the tonnage which might have gone elsewhere. If present factors restraining international trade should totally exclude Canadian pulp and paper from the sterling area, available wood supplies and productive capacity would appear to be insufficient to meet even the present reduced levels of usage in that area. "The fact is," said Mr. Fowler, "the world needs Canadian pulp and paper products and the inherent ingenuity and impulse of mankind to trade will, in the long run, surmount difficulties which are the aftermath of two world wars within a generation."

In his review, Mr. Fowler said newsprint mills in 1949 will have turned out 5 million tons, an increase of 170,000 tons over the previous year. Total pulp production would be some 8 million tons, about the same as last year. But chemical pulp and ground-wood pulp shipments have dropped, due largely to heavy U. S. inventories which overhung the market during the first half of this year. Total pulp exports to the U. S. for the year were at the 1,400,000 ton mark compared with 1,591,042 tons. Exports overseas totaled about

235,000 tons, higher than in 1948, but largely maintained by Marshall Plan purchases.

Although Mr. Fowler expressed confidence that trade difficulties would be surmounted in the long run, he said the present problem could resolve itself in one of two "undesirable directions." The non-dollar countries might turn to the Soviet Union for supplies of pulpwood, making "the free press of the non-dollar democracies dependent on forests controlled by Russia." Or, carried to its ultimate conclusion, the present trend, applying not only to paper but international trade in general, might reduce industrial activity and trade throughout the world. This would affect Canadian and United States economies and ultimately "the great press of the United States and its demand for newsprint from Canada." Meanwhile, United States publishers, consuming 85 percent of the Canadian output, printed more pages and more advertising and increased their circulation in 1949. "More than this, newspaper lineage in the United States has risen substantially year by year over the past four years, whereas radio and magazine lineage have remained virtually unchanged. In short, newspapers are becoming even more dominant among all the media in the advertising field."

A. M. Collins Reorganizes

PHILADELPHIA—Reorganization and recapitalization of A. M. Collins Mfg. Co. has been announced by Lawrence B. Kelley, president. New capital has been put into the company and the ownership now rests in the hands of the present management. All of the old indebtedness, including the trade creditors and banks, has been paid off, and the company is now operating on a sound basis.

For nearly 100 years, A. M. Collins has been a leader in its field. It is now producing high grade cover papers, leatherettes, tag and ticket coatings and other specialties, mostly in the field of coated, embossed and decorated papers. New lines and new plans are expected to be announced later.

Newsprint Shipment to Tennessean

NASHVILLE, Tenn. — The fifth this year, and reportedly the largest shipment of newsprint ever to reach the *Nashville Tennessean*, recently arrived from Cornerbrook, Newfoundland. It consisted of 16,000 tons and was carried up the Cumberland by a giant river barge which could not be more heavily loaded because it was already skimming the bottom of the river's eight-foot channel. It is expected that a sixth and last shipment for the year will leave Cornerbrook before the port freezes over.

T. T. Paul Retires from Fort Orange

CASTLETON, N. Y. — Thurston T. Paul, recently retired treasurer of the Fort Orange Paper Co., was guest of honor at a banquet held in Albany on December 4. Mr. Paul was with the company for about thirty years.

Kansas Promotes Straw Mill

TOPEKA, Kansas — The Kansas Industrial Development Commission has recommended the construction of a pilot plant in the area of Topeka to make about 50 tons of bleached straw pulp for production of specialty papers and newsprint. A survey made by the University of Kansas Research Foundation showed that supplies of straw, other raw materials and natural resources are sufficient to support such a mill in the area. Technical assistance of the Northern Regional Research Laboratory of the Department of Agriculture, Peoria, Ill., are available to assist anyone interested in such a project, according to the report.

Carolina Paper to Start in January

ROCKINGHAM, N. C. — Scheduled to start operations early in January, the first tissue manufacturing plant in the South is now being completed by Carolina Paper Mills, Inc. The former Sunoco paper mill at Rockingham has been taken over for this purpose and is being thoroughly modernized and equipped with the newest high speed paper making machines, each with a productive capacity of 1,000 feet per minute. The new machinery is being installed by Downington Manufacturing Co.

Waterline Break Closes Mills

PORT ANGELES, Wash. — A 150-foot break in the Elwna River industrial waterline near Port Angeles, Wash., on December 18 shut down Crown Zellerbach and Rayonier mills and curtailed production at Fibreboard Products, Inc. About 1,000 men are affected by the shutdown. It is estimated that it will take at least three days to make emergency repairs.

Moran and Zonner Advanced

NEW YORK — St. Regis Paper Co. has appointed D. A. Moran as resident manager of the company's mill at Deferiet, N. Y., effective January 1.

Mr. Moran, widely known in the trade as "Pat," has been associated with the paper industry for over 26 years. His first two years were spent with the Chillicothe Paper Co. and for the past 24 years he has been with the Mead Corp., at Chillicothe, Ohio. A member of the Dayton, Ohio, Club of Printing House Craftsmen for 15 years, Mr. Moran has served on various committees of the Printing House Craftsmen, as well as committees of the Printing Industry of America. With the Mead Corp., Mr. Moran played a prominent part in employe relations as organizer and president of the Employee's Credit Union and as national director of the Credit Union National Ass'n. He has acted as president of the Foremen's Club of Mead and in general has taken an active and effective interest in both company and community affairs.

W. A. Zonner, manager of the Deferiet mill and general manager of manufacturing for the division in New York State, is being transferred at the beginning of the year to the New York office to head a newly-created Manufacturing Development Department. Mr. Zonner will act as a liaison between sales and manufacturing in the development of new products and in development work on new and major accounts.

Mr. Zonner joined St. Regis in July, 1948, as manager of the Deferiet mill and in June of this year was also appointed general manager of manufacturing for the Printing, Publication and Converting Paper Division in New York State. A native of Ohio, Mr. Zonner came to the company from the Appleton Machine Co., and prior to that was associated with the Consolidated Water Power and Paper Co. and the Mead Corp.

Strathmore Opens House for Bankers

SPRINGFIELD, Mass. — The Strathmore Paper Co., with mills in West Springfield and Woronoco, Mass., held an open house for top officials of the commercial banks in Springfield, West Springfield and Westfield — the communities in which the company operates. About fifty bank executives were taken through the Strathmore No. 2 Mill at Woronoco and were shown the steps of paper manufacture from raw material to finished stock. Members of Strathmore's management group served as guide. The guests were received by the Strathmore executive committee: George E. Williamson, president; C. M. Bryan, vice-president in charge of production; A. E. Shattuck, vice-president and manager of supply; F. Nelson Bridgham, vice-president and treasurer, and Harry E. Riggs, vice-president in charge of sales.

Rochester "Old Timers" Meet

ROCHESTER, N. Y.—102 "old timers" of the Rochester Folding Box Co., including five who are retired, joined in a dinner meeting and presentation of awards December 14 at the Rochester Club. R. T. Maston, Jr., general manager of the folding carton division, was toastmaster. Anthony Haines, vice-president in charge of container operations, and Karl W. Schneider, executive vice-president of Rochester Folding Box Co. and in charge of paper board mills for Kiekhefer-Eddy Corp., presented the awards. Special guests were T. E. Morris and Irvin Radke, sales managers, respectively, of the boxboard and container divisions of the Eddy Co.

Protest Paper Mill Smoke

LAWRENCE, Mass. — Two hundred Prospect Hill residents recently issued a complaint against alleged conditions created by smoke and dirt from the main chimney of the Champion International Paper Co. The company, reportedly, already has spent $40,000 to correct the condition. The city council, which is waiting for a reply from the firm, feels that the management of the mill will work out some solution.

Scott to Install Another Machine

CHESTER, Pa.—Scott Paper Co. has announced plans for the installation of an additional high-speed paper machine at the company's Chester plant. The new machine, for the manufacture of toilet tissue, will be the tenth in the Chester operation and the twenty-third in the over all Scott line-up. The machine will incorporate many of the mechanical advancements installed on the machines recently completed at Fort Edward, N. Y., in the plant of Marinette Paper Co., Scott subsidiary. An addition to the present plant building will be constructed to house the machine. The installation, including supporting equipment and building addition, is expected to cost approximately $4 million. The production from the new machine will be available for distribution during the latter part of 1950.

B. C. Mill Safety Directors Meet

VANCOUVER, B. C.—Pulp and paper mills in British Columbia were represented by their safety directors and supervisors at a two-day session at the Hotel Georgia. The delegates discussed present and future accident problems, in an effort to learn from each other's experience how to avoid accidents. Closing session of the meeting was a dinner at which Dr. W. G. Black of the University of British Columbia department of philosophy and psychology was speaker. Among those in attendance were: L. J. A. Rees, Ocean Falls; Gordon Dubberley, Woodfibre; E. T. Tucker, Port Alice; Arnold Raymer, Victoria; Stuart Slade, E. R. Needham and Frank Flett, Powell River; V. Mahoney and Frank Robertson, Ocean Falls; C. R. Rustemeyer, J Visak and J. C. Hyslop, Vancouver; and H. H. D. Fowler, C. J. Wright and Leander Manley, secretary-manager, Canadian Pulp & Paper Ass'n., western branch.

NEPCO Foundation Grants

Contributions totaling more than $14,500 are being distributed to seven Port Edwards and Nekoosa churches and seven other local, county and state charitable and educational institutions by Nepco Foundation of Port Edwards, Wis., according to an announcement issued by John E. Alexander, president.

St. Alexander's Parish and the Port Edwards Community Methodist Church, both in the village of Port Edwards, are receiving checks for $750. The St. Paul Lutheran Church of the town of Port Edwards is granted $200. The four churches in Nekoosa receiving contributions are: Nekoosa Congregational Church, $750; Sacred Heart Church, $750; Bethlehem Lutheran Church, $750; East Nekoosa Assembly of God, $375. The six other local organizations to benefit by the grants are Riverview Hospital, Wisconsin Rapids, $3,000; Nepco Lake Boys and Girls Club Association, $3,000; South Wood County American Cancer Society, $300; American Red Cross, $300; South Wood County Community Chest, $3,350; Wisconsin Society for Mental Health, $250.

The list of gifts is completed with the announcement of another installment of $2,100 on the three year $6,300 industrial fellowship for the study of insect control in stored pulpwood at the University of Wisconsin. The study, announced in the spring of 1948 as established by Nepco Foundation, will run until March 31, 1951, and results of the research will be made public by the University of Wisconsin through publication or any other manner best serving the public interest.

Nepco Foundation was established in November, 1947, as a charitable, nonprofit corporation to be operated exclusively for religious, charitable, scientific or educational purposes for residents of the state of Wisconsin. Officers of Nepco Foundation are John E. Alexander, president; W. A. Radke, vice-president; S. A. Casey, secretary-treasurer.

West Virginia & U. P. W. Agreement

WASHINGTON, D. C. — Representatives of the West Virginia Pulp & Paper Co., and of the United Paper Workers of America (CIO) announced a tentative agreement on a new employe-management contract. Spokesmen for the company and union said the agreement covered a new pension plan and a broader social insurance program.

Some 4,200 workers in factories at Covington, Va., Williamsburg, Pa., and Luke, Md., are affected.

In a joint statement, the union and company said the new pension plan is non-contributory and will supplant a contributory plan installed in 1948.

Newfoundland Road Links Coasts

OTTAWA — Joint effort of Anglo-Newfoundland Development Co., Bowaters Pulp & Paper Mills, Ltd., and Newfoundland Government for a road over Gaff Top mountains, sometimes termed the roof of Newfoundland, has resulted in the construction of a highway which links paper mill towns of Corner Brook and Grand Falls in Newfoundland. Road transport from coast to coast is possible for the first time with the possibility that the highway may become part of the Trans-Canada Highway sponsored by the Canadian Government. In addition to making the area accessible to tourists, it is going to give access to thousands of square miles of timber not yet adequately explored.

Hayes Named Asst. Works Mgr.

BERLIN, N. H. — Milton W. Hayes, since 1948 manager of the production control department of Brown Co., Berlin, N. H., has been named assistant to the works manager, E. E. Morris. Mr. Hayes, as assistant to Mr. Morris, will be responsible for the Bermico, Onco, Chemical and Floc Manufacturing Divisions. He also will be responsible to the works manager for the Quality Control Department and its work throughout the Berlin operations.

Keeth of Marathon Honored

ROTHSCHILD, Wis. — Grover Keeth, chief power engineer, Marathon Corp., at a recent meeting of the Wisconsin Registration Board for Architects and Professional Engineers, was elected chairman of the engineering division. In his election to this office, he succeeds J. L. Ferebee, who was forced to resign on account of ill health. Long active in the affairs of The American Pulp and Paper Mill Superintendents Ass'n., Mr. Keeth served as president of that association for the year 1942-1943.

Napanoch Arrangement Filed

NAPANOCH, N. Y.—Napanoch Paper Mills, Inc., has filed an arrangement under Chapter XI of the Chandler Act offering unsecured creditors 20 percent cash. The total liabilities have not been stated; assets are approximately $70,000.

St. Helens Buys Salmon Creek Timber

ST. HELENS, Ore. — The St. Helens Pulp and Paper Co. has purchased timber on state lands of the Salmon Creek area for $8,205, according to Verna Jacobson, Pacific county auditor. The transaction was completed on December 6.

B. C. Gets Forest Management License

PORT ALICE, B. C.—British Columbia Pulp & Paper Co. has been granted a forest management license by the British Columbia government covering 100,000 acres in the Quatsino Sound area of British Columbia.

Southern Paperboard Elects Dyke

SAVANNAH, Ga. — George E. Dyke, president of Robert Gair Co., Inc., has been elected president of the Southern Paperboard Corp., a subsidiary. He succeeds Ernest Rossiter.

R. J. Davis Made Sales Mgr.

HOLYOKE, Mass. — Reginald James Davis has been appointed sales manager of the boxed stationery division of the Whiting Paper Co., with New York offices at 745 Fifth avenue.

Canadian Export Outlook

OTTAWA — Canadian manufacturers and producers, who have in the past been unable to compete with their American counterparts in this non-Empire market but whose selling prices have been not more than 9 percent higher than the American prices, will now be able to make more headway in the Belgo-Luxembourg markets which are equally as accessible to Canadian exporters as to American suppliers, states W. Gibson-Smith, Assistant Commercial Secretary for Canada, in a report from Brussels to Foreign Trade, Department of Trade and Commerce, Canadian Government. On the other hand, he continues, the severe devaluations in the sterling area, Scandinavia and elsewhere, will mean much more serious competition in many lines and this will be particularly true with regard to pulp and paper, the Scandinavian prices for which are increasingly difficult to match.

New England Stream Potentials

PROVIDENCE, R. I. — Engineers could develop another 1,084,775 kilowatts of hydro-electric power on New England's rivers if they could do the job with no strings attached, according to *the Providence Journal-Bulletin* in a series of articles by business and financial editor, George H. Arris who traveled up and down the rivers on his assignment.

The figure is based on a six-week survey conducted by Mr. Arris and is the estimate of engineers from the U. S. Geological Survey, state public utility commissions and privately-operated public utility companies. However, no more than 500,000 to 600,000 kilowatts of this could be developed feasibly by private industry interested in profit, according to these engineers, it is reported, nor did the figure include provisions for additional water storage.

The New England Council has estimated New England's potential at 500,000 kilowatts, if privately developed. The Federal Power Commission, on the other hand, has set the figure of 3,119,000 kilowatts as feasible under government financing. The Journal-Bulletin said the purpose of its survey was to find the "true" figure.

The paper based its figure upon a survey of 21 rivers. To develop this total, it was said, would mean "wholesale damage to communities and property in the river valleys" and to ride roughshod over state laws regulating heights of dams and water draw-down in certain lakes."

Engineers studying the "meager details" on the FPC's estimate, according to the paper, said it could be brought into being only by diverting rivers, writing off large amounts of existing hydro-electric installations and industrial property and resorting to "high-cost engineering schemes" such as pumping water for storage purposes to increase available water flow. The newspaper said it learned that the FPC estimate was an "engineering desk job based on book records"—that no engineers went into the field and that the figure was never intended to be more than a rough sketch as a basis for further study.

Riegel Paper Corp. Reports Profits Up

Dollar sales volume of the Riegel Paper Corp. dropped more than three million dollars from the 1948 total during the 40 weeks ending October 9, while net profits managed to gain over the previous year, the company has reported.

In a report to stockholders, President John Riegel disclosed that net sales of $17,359,414 had yielded a profit of $1,033,909 in the 40 weeks of 1949, while net sales of $20,638,259 for the comparable period of 1948 yielded only $997,263. The earnings were equivalent to $2.64 per share of capital stock compared to $2.53 the previous period.

LEFT TO RIGHT: D. W. WILKINSON, JOHN B. HAY, R. M. HEATH INCLUDED IN THE Scott Paper Co. recently announced changes in the plant management of its Chester, Hoboken and Sandusky plants and the Fort Edward and Glens Falls, N. Y., and Marinette, Wis., mills of Marinette Paper Co. Darcy B. Wilkinson, vice-president and general manager of the Marinette plant, will be transferred to the Fort Edward mill where he will replace John B. Hay as vice-president in charge of its operation. Mr. Hay will become manager of the Hoboken plant and Russell M. Heath, general manager of the Cut-Rite Division, which formerly included the Hoboken and Sandusky plants, will go to Marinette as plant manager.

Paul C. Baldwin, manager of the company's Chester, Pa., plant, will devote a large share of his time assisting the general manager of paper mills, and John W. McNichol, who has been production manager of the Chester plant, has been promoted to assistant plant manager.

Henry S. Godshall, Chester maintenance engineer, has been made manager of the Sandusky, Ohio, plant and Roderick Sears, Hoboken plant superintendent, will move to Glens Falls as plant manager. Calvin T. Dussoulas, Sandusky superintendent, will move to Chester where he will handle special assignments.

After provision for taxes on income, the company's earnings totaled $643,121 this year.

A quarterly dividend of 35 cents per share and a year-end extra dividend of 45 cents per share, payable December 10 to stockholders of record December 1, was declared by the board of directors. This makes total dividend payments of $1.75 per share in 1949, compared with $1.35 per share in 1948.

G. W. Brooks Urges Simplicity

Management must make "more intelligent and less complicated" what it says to workingmen, especially about matters bearing on wage and hours, George W. Brooks, research and education director of the International Brotherhood of Pulp, Sulphite and Paper Mill Workers, said in an address. He spoke before Newark Chapter, National Association of Cost Accountants, and guests from the Newark Chamber of Commerce, Rotary Club and the Newark Control of the Controller's Institute in the Robert Treat hotel, on December 15.

Speaking on "The Role of the Cost Accountant in Labor Relations," Mr. Brooks asserted that industrial technicians, like accountants, had a "crucial role" in the exchange of information between employer and employes. Brooks criticized the fact that technicians had shown little interest or understanding of labor unions, and that unions had little appreciation of the significance of the technician in industry. He said that, although the situation is improving, much remains to be done.

CONVERTERS . . . .

Gevaert Introduces New Paper

NEW YORK — Gevaert Co., 425 W. 55th street, has introduced a new kind of paper for the making of monochrome prints from color transparencies. "Diaversal" paper, the new product, has about the speed of fast enlarging paper and may be handled in the regular darkroom safelight, it is reported. The transparency, enlarged or printed by contact, is handled in the usual way and developed in a standard print developer. It is then given three minutes in a second Gevaert bath, after which the upper layer of emulsion which carries the negative image is washed off, leaving a faint positive of the picture. This is then brought out in a regular toning bath. The whole process is said to require less than ten minutes and produces a sepia print that should be permanent without more than a five-minute wash. It is expected Diversal paper and the reversing solution will be available early in January.

P. D. Cooper Made Vice-President

NEW YORK—Peter D. Cooper, vice-president of Celanese Corp. of America, was elected a member of the board of directors of the company on December 6. Mr. Cooper, who joined the organization in 1924, is generally responsible for overall plant operating efficiencies and the economic planning of production at all of the company's plants. He was made a vice-president on August 23, 1945.

Dixie Cup Co. Elects Officers

EASTON, Pa.—A. R. Lillicrapp, W. G. Genne and A. J. Nolan have been elected vice-presidents of Dixie Cup Co. W. O. Roe has been named assistant to the president. B. J. Kearney and Richard W. Koch, assistants to the executive vice-president; R. E. Stocker, assistant development director in charge of engineering research; S. L. Muther, assistant to vice-president Nolan; J. W. Kuebler, general works manager in charge of production operations in all plants. W. E. Bachman, Jr., Easton plant superintendent, and Charles Melick, supervisor of production planning and inventory control.

Disbrow Reports Increased Demand

EAST ORANGE, N. J. — The Disbrow Manufacturing Co., Inc. which serves the kraft packaging requirements of the seed trade, reports it has been turning out a million seed packets and self-seal envelopes each week and that since October it had been working on two eight-hour shifts a day. However, a recent order for twelve million packets from one seed distributor has necessitated using a third shift of workers. The packets come in sizes which hold from half an ounce to 50 pounds of seeds. This demand is reportedly the result of predictions that retail sales of vegetable seeds will rise 20 percent next summer.

F. F. Williams Resigns

TROY, Ohio—Frederick F. Williams has announced his resignation as sales manager of Gummed Products Co. He represented the company in the Cleveland district for fourteen years before being called to the home office in 1946 to assume the duties of sales manager. Mr. Williams has had wide experience in the paper and cloth converting fields and is well known, not only among paper merchants, but also in the corrugated box industry. He expects to announce his future plans shortly. His headquarters are 410 S. Plum street, Troy, Ohio.

Papercraft Christmas Party

PITTSBURGH — More than 300 guests attended the annual Christmas Dinner Party held for employes by the Papercraft Corp. in the Gold Room of the Roosevelt Hotel on December 17. Highlights were the distribution of company gifts by Joseph M. Katz, president, and the exchange of gifts among employes in the many departments of the firm. Special guests at the party were the company's field representatives.

Azon Corp. Reports Progress

BINGHAMTON, N. Y. — Azon Corp., established this year for the production of specialized papers, has doubled its working force since it started production last March. The firm now has a paper coating machine capable of turning out more than 1,000 linear yards of sensitized paper a month and has made provision for installation of a second machine.

Celanese States Its Case

NEW YORK — Harold Blancke, president of the Celanese Corp. of America, issued the following statement with reference to the suit filed December 5 by the Antitrust Division of the Department of Justice against the corporation:

"This suit is based soely on the fact that in February, 1946, the Celanese Corp. of America acquired by statutory merger the Tubize Rayon Corp. Up to that date Celanese had facilities to produce acetate rayon yarn only. It had no facilities to produce viscose rayon. Its competitors, however, such as DuPont and American Viscose, were equipped to produce *both* acetate rayon and viscose rayon. Since many modern fabrics require both these types of rayon, Celanese, without viscose yarn, was under a great competitive disadvantage. The Tubize Rayon Corp. did have facilities for making viscose rayon yarn. Our predominant purpose in this merger was to acquire those facilities of Tubize.

"The result was not to restrain competition, as asserted by the Antitrust Division. The merger had just the opposite effect. It increased competition. It enabled Celanese to compete on equal terms with all the dominant corporations in the rayon yarn field.

"As an incident to the acquisition, Celanese had to take over the warp knit facilities of Tubize. The Antitrust Division asserts that the effect of this was to create a restraint of trade in warp knit rayon fabrics. This assertion cannot be sustained. The percentage of warp knit facilities which Celanese now has, compared with the rest of the industry, has been held by numerous decisions of the Supreme Court of the United States not to constitute either a monopoly or a restraint of trade. Now, four years after the acquisition, the Antitrust Division apparently is seeking to set aside these clearly-defined court decisions, on which all business men had the right to rely.

"The merger has resulted in no price increase of our rayon yarn or fabrics; nor has it had any disadvantageous effect on any consumer of our products. There have never been any unlawful practices committed, nor, as far as we know, has the government even made such a charge. Under these circumstances Celanese has no choice but to resist this suit until final decision by the Supreme Court."

Samuel I. Rosenman, counsel to Celanese Corp., said: "This action is brought under both the Sherman and Clayton Antitrust Acts. It is clear to any antitrust lawyer that this is a suit seeking to change existing principles of antitrust law already established by the Supreme Court, in order to make these principles conform to the wishes of the Antitrust Division.

"These principles establish the indisputable legality of this acquisition under the Sherman Act. Equally well settled decisions of the Supreme Court ever since the passage of the Clayton Act in 1914 make it clear that that Act is also not applicable to this transaction.

"It is well known that the Antitrust Division is not satisfied with either of these long lines of decisions under either statute and has been seeking for some time to change them. This suit seems to be the vehicle chosen for that purpose and Celanese seems to be the guinea pig. In my opinion, based on an exhaustive study of the facts, Celanese has not violated either statute. It will resist this effort to overrule existing law."

New Fibreboard Milk Bottle Container

ALLENTOWN, Pa. — A VUS solid fibreboard milk bottle container with cover replaces the old style heavy wood case at Lehigh Valley Cooperative Farmers of Allentown. This container, which holds twelve one-quart paper milk bottles, is made for them by Robert Gair Co., Inc., New York, manufacturers of paperboard, folding cartons and containers.

Not only is this paperboard container lighter in weight and easier to handle, but Lehigh Valley Cooperative finds that it has decreased the number of bruised paper bottles causing leakage of milk. Cases are returned and are capable of being used for many trips. This VUS waterproof solid fibre container is smaller than wood or aluminum cases and saves space in delivery trucks and stores.

Container Industry Report

WASHINGTON, D. C.—Available data indicates that the 1949 physical volume of container business will be reasonably close to the high level of 1948 and that the outlook for the spring of 1950 is good, according to the U. S. Department of Commerce.

The 1949 winter issue of the quarterly "Containers and Packaging Industry Report" made public today states that demand picked up in the third and fourth quarters of this year after having slackened in the four preceding months.

The year saw more container users becoming increasingly conscious of the need for distinctive packaging and it is expected that in 1950 users will demand more attractive packages to stimulate consumer interest in their products, according to the report.

Plastic and transparent flexible packaging probably received the most attention during 1949 but other types of packaging such as attractive window paper bags and boxes, highly colored paperboard containers with laminated finishes, mesh bags, new type tin and glass containers and many others received increasing attention.

Current trends in each segment of the containers and packaging trade are reviewed in the report. A digest of local container trends and current economic conditions in various areas of the country as reported by Department of Commerce field offices is also included.

(Continued on page 44)

Welfare State Debated

The last meeting of the *New York Chapter of Cost Accountants* drew 600 members and guests to hear Dr. Robert R. Nathan, R. R. Nathan Associates, Washington, representing Labor, and Dr. Emerson P. Schmidt, United States Chamber of Commerce, debate the welfare state. Mr. Leo Cherns, Research Institute of America, was moderator. Dr. Nathan based his affirmative argument on the basis that government exists for the greatest good for the greatest number of citizens. Capitalism can only exist if it finds the ways and means of eliminating boom and bust periods.

"In my judgment," he added, "there are three primary objectives of the welfare state which must be successfully pursued:

"1. The Government must insure a healthy economic environment, which means sustained full employment and continued high levels of production. This can be accomplished without regimentation and without Government ownership of productive resources. Progress toward this objective has been painfully inadequate.

"2. The Government bears the responsibility to provide the environment for vigorous competition and maximum opportunities. Too many business men profess belief in the competitive systems but practice monopoly in their own operations.

"3. The Government must take measures to provide minimum security for all its people against the inevitable hazards which experience has shown to be inherently associated with a capitalistic and competitive economy. Obviously, these measures must not be of such magnitude as to destroy incentives and initiative. Equally obviously, a humane and progressive democracy cannot long be blind to the basic needs of its people."

The welfare state with its planned economy is the only effective instrument to obtain this objective. Lacking stability, capitalism will fail.

Property rights would not be socialized, however, the tax power of government would be used to regulate all incomes and all risks. The government, by a variable tax policy, would then be in the position to expand or contract the economy, to increase social benefits and do all things necessary to gain the above objectives.

Dr. Schmidt, presenting the negative, based his argument on the fact that the United States has grown to be the most prosperous economy that the world has ever known by using a free enterprise system. Its people enjoy the highest standard of living and security as a result of the free market and absence of planned economy such as Dr. Nathan advocates. He emphasized that the attack upon the capitalistic structure came from "band wagon" intellectuals and politicians struggling desperately for office, power and salaries connected therewith. These powerful forces are leveling and socializing income, by the progressive income tax, "soak the rich" tax policies, financial policies to drag down interest rates on trust and savings accounts, minimum wage increases, Brannanism, rent control, and public housing. Capitalism, in his opinion, cannot stand these leveling and socializing policies.

If this system has produced so much to be upheld, then the free market must be preserved at all costs.

More Fuel For The Fire Of Confusion

Man's quest for security might be defined as the 4 Freedoms. Powerful forces intrenched in Washington, our universities and among our intellectuals have developed the planned economy now emerging as the Welfare State. Basically, ownership of property presently held inviolate; the income however will be subject to political control under the democratic process that the majority rules. The Kaiser and Hitler used the same argument under "Might is Right."

The pattern of the Welfare State shapes up, whereby taxation will govern our economy and its essential free market.

The Welfare State has tremendous appeal, it is dressed up with catchy phrases, offers to all men all things. Paradise will have arrived without the price tag attached nor the label of Socialism, Fascism, Communism when the full Welfare State takes over.

The battle lines are being drawn, a concentrated attack must be initiated. The weapons are:

1. Search your business conscience, anticipate and remove all basis for legitimate criticism.
2. Fight for and actively support a sound fiscal and monetary policy on Local, State and National levels.
3. Improve your understanding of our economic system, why it was developed, its greatness, study its weaknesses, develop objective improvements.
4. Practice Americanism and preach it effectively where it will do the most good, among our younger people, our employees, in our universities.
5. Broaden your outlook and understanding of the social and economic needs of the people of your community and strive to develop the means to fulfill their desires and needs, under the American System.

SELL AMERICA ON AMERICA. **EDITOR.**

4,565,000 CORDS

NATIONAL FOREST TIMBER FOR SALE

Embracing

WESTERN SLOPE PULPTIMBER UNITS IN COLORADO

LOCATION AND AMOUNT—All the merchantable timber designated for cutting within units W-1, W-3 to W-12 inclusive, and W-14 to W-36 inclusive, and W-41-A, W-42 to W-45 inclusive, W-48, and W-49, White River National Forest; Units R-1 to R-4 inclusive and R-13, Routt National Forest; Units G-2 and G-3, Grand Mesa National Forest; and Unit U-1 within the Uncompahgre National Forest, the boundaries of which units are shown on maps on file at the office of the Regional Forester, Denver, Colorado, and the Chief, Forest Service, Washington, D. C., on the Western Slope of Colorado and in general tributary to Glenwood Springs, with the Units grouped in Blocks A and C, estimated to be 3,325,000 cords, more or less, primarily beetle-killed Engelmann spruce, and 1,240,000 cords, more or less, of live and insect-killed Engelmann spruce, lodgepole pine, alpine fir, and other species in Blocks B. and D.

SALE CONDITIONS—Prospectus and sample sale agreement which fully state the conditions of sale are available on request from the Regional Forester, Denver 2, Colorado, or the Chief, Forest Service, South Agriculture Building, Washington 25, D. C.

STUMPAGE PRICES—The bid rates will apply to timber measured on a cord basis and primarily intended for pulp manufacture prior to May 1, 1958. Lowest rate considered for material to be so measured is $0.75 per cord for stumpage and, in addition, a deposit of $0.50 per cord will be required for sale area betterment work. Bidders must agree to pay the following fixed rates until May 1, 1958, for material of any species to be manufactured for sale or sold by the purchaser in other form than pulpwood: $3.50 per M feet board measure for sawlogs or their products, $3.00 per thousand linear feet for props, $4.00 per thousand linear feet for poles 16-9 feet in length, $5.00 per thousand linear feet for poles 20-29 feet in length, $12.00 per thousand linear feet for poles 30 to 39 feet in length, $20.00 per thousand linear feet for 40 to 49 foot poles, $25.00 per thousand linear feet for poles 50 feet or longer, and $3.00 per MBM for material used in construction of logging improvements. All rates are subject to readjustment by the Chief, Forest Service, on May 1, 1958, and at five-year intervals thereafter under the conditions and limitations stated in the sample agreement.

QUALIFICATIONS FOR BIDDING—Parties wishing to enter bids must file with the Chief, Forest Service, on or before March 6, 1950, a statement evidencing (1) their financial resources to make the essential surveys, designs, and plans which must precede actual construction and operation and, (2) names, business standing and experience of the prospective bidder and his associates in connection with the manufacture or distribution of pulp and paper products, or the construction or operation of large industrial projects. The Chief, Forest Service, will inform each applicant on or before March 20, 1950 as to whether he has qualified as a bidder. No applicant will be approved as a bidder unless his statement shows reasonable evidence in the opinion of the Chief, Forest Service, that he will be able to qualify for final award of the timber sale agreement. The successful bidder will be required to show on or before June 30, 1951, that he has immediately available, or will have available as needed, sufficient funds to provide the improvements, equipment, and working capital necessary to enable him to meet the requirements of the agreement. As a minimum, such showing before final award must include evidence that a fund of at least $10,000,000 to draw on for plant construction activities is or will be available. An extension of time not to exceed one year for qualification for final award may be granted by the Chief, if the successful bidder has demonstrated good faith through substantial expenditures on essential surveys, designs, and plans and has evidenced his ability to qualify within such one-year extension.

DEPOSIT AND BOND—In addition to qualifying for bidding, any person entering a bid at the auction must post with the Forest Officer in charge, as a guarantee, a bank draft or certified check in the amount of $25,000, payable to the Treasurer of the United States, which will, in the case of the successful bidder, be applied to the purchase price of the timber or retained as liquidated damages. Remittances of unsuccessful bidders will be returned immediately after completion of the auction. In event the successful bidder fails to furnish a financial statement, to execute the sale agreement and to furnish the bond required by its terms not later than June 30, 1951, or not to exceed one year additional, if such time extension is granted by the Chief, Forest Service, then in view of the difficulty of estimating the actual damages which will be sustained thereby, said deposit shall be retained by the United States as liquidated damages and not as a penalty. At time of final award of the timber sale agreement, the bidder will be required to furnish $50,000 surety bond as stipulated in the agreement.

AUCTION BIDDING—Oral auction bids will be received by the Chief, Forest Service, Room 3008, South Agriculture Building, Washington, D. C., beginning at 2:00 P.M. on March 29, 1950. Sealed bids from qualified bidders will be considered the equivalent of an oral bid and will be posted for the information of all bidders. Preliminary award to the highest qualified bidder will be made at the close of bidding. Such high bidder must thereupon immediately sign a "Bid for Advertised Timber" at the highest rate bid by him at the auction. The right to reject any and all bids is reserved. Full information concerning the character of the timber, conditions of sale, and requirements to qualify as a bidder, may be obtained from the Chief, Forest Service, South Agriculture Building, Washington 25, D. C., or the Regional Forester, Denver 2, Colorado. D-29

FORESTRY

N. Dak. Launches Tree Farm Program

WASHINGTON, D. C.—North Dakota is the Nation's twenty-seventh tree farm state and the first to certify shelterbelt woodlots. The North Dakota Tree Farm program, launched in Bismarck on November 29, is sponsored by the School of Forestry and the State Farm Forestry Committee. Already 17 different ownerships, totaling 1,536 acres, have been certified as tree farms.

"Trees are our only renewable natural resource," Governor Fred G. Aandahl declared, "and it is our duty as good citizens to develop this resource, not only for the present, but for future generations as well." The North Dakota governor was the principal speaker at the tree farm launching ceremony held in Bismarck's War Memorial Building. "Without an active forestry program in North Dakota, the development of the state will be retarded. The result will be a tremendous loss not only in timber but, in addition, the resulting loss of soil from wind erosion and other damages will be almost incalculable," Governor Aandahl said.

Stresses Forest Fire Prevention

WASHINGTON, D. C.—Keep your eye on a cartoon film character named "Woody." As the featured player in American Forest Products Industries' newest filmstrip, "Keep America Green," he appears headed for certain stardom in the field of forest fire prevention. Through 48 frames of a four-color, 35 mm. filmstrip, Woody does a convincing, if sometimes puckish, job of telling the American people why and how forest fires should be prevented.

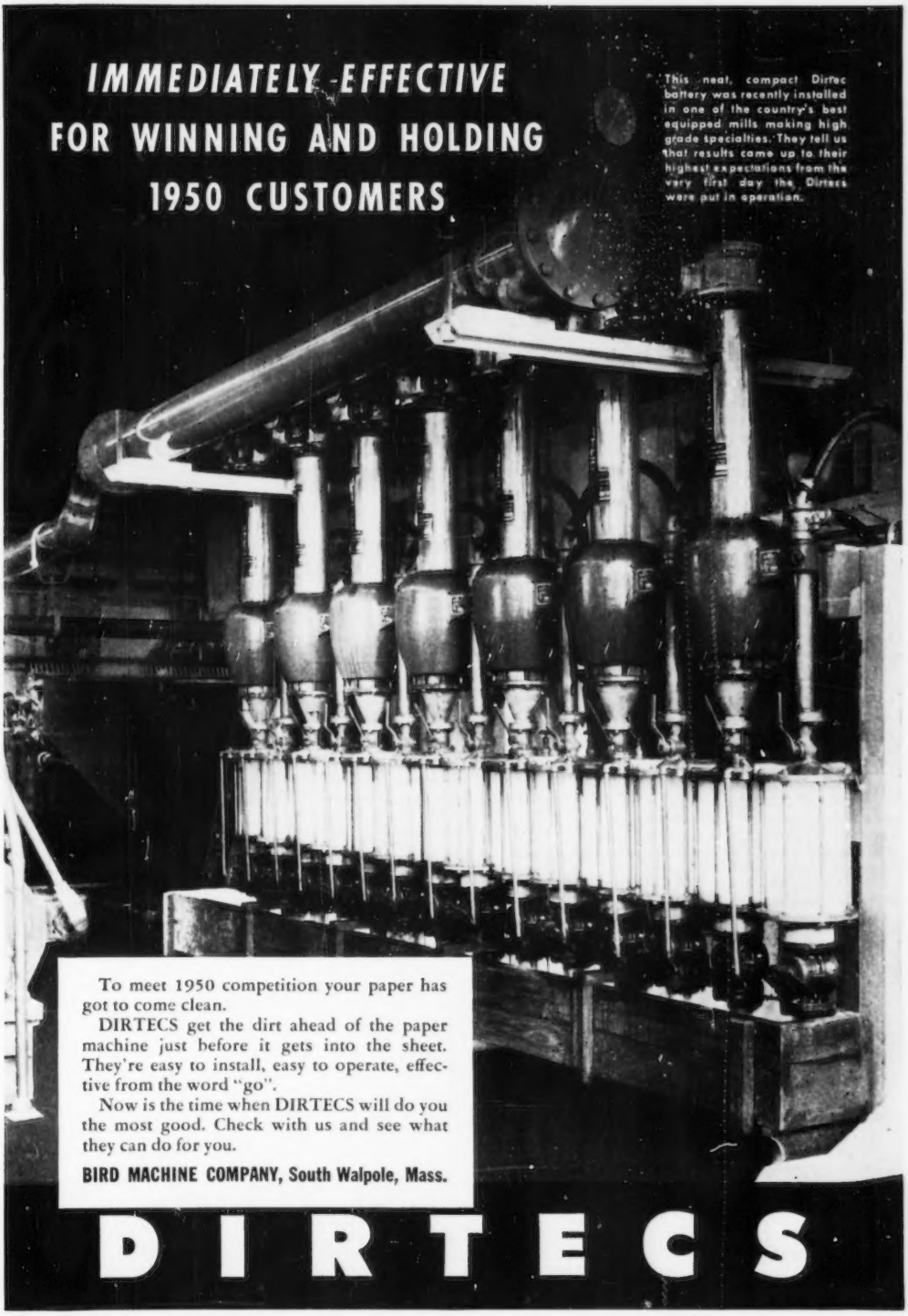
National Forest Timber Offering

WASHINGTON, D.C.—The largest national forest timber offering ever made in this country, comprising 4½ million cords of pulpwood, was announced by the Forest Service during the week of December 19. The tract was advertised for sale following some weeks of speculation. It is located in Western Colorado on the White River, in the Routt, Grand Mesa, and Uncompahgre national forests.

Terms of the proposed sale call for establishment of a pulp plant with a capacity of at least 200 tons a day on the western slope of the state, where the timber is located. Estimated cost of the mill is $15,000,000, and operations as a whole are expected to employ 600. If this project materializes, it will make the first such mill to be established in Colorado.

Raw material, said the Forest Service, will be provided by 3,325,000 cords of dead Engelman spruce and 1,240,000 cords of green spruce and pine, included in the sale. Forest Service estimated that this is sufficient for 30 years' operation (the duration of the contract) by a mill of this capacity. Utilization of the dead spruce, which resulted from beetle infestation, marks the greatest timber salvage project

IMMEDIATELY EFFECTIVE
FOR WINNING AND HOLDING 1950 CUSTOMERS



This neat, compact Dirtec battery was recently installed in one of the country's best equipped mills making high grade specialties. They tell us that results come up to their highest expectations from the very first day the Dirtecs were put in operation.

To meet 1950 competition your paper has got to come clean.

DIRTECS get the dirt ahead of the paper machine just before it gets into the sheet. They're easy to install, easy to operate, effective from the word "go".

Now is the time when DIRTECS will do you the most good. Check with us and see what they can do for you.

BIRD MACHINE COMPANY, South Walpole, Mass.

DIRTECS

ever attempted on national forest land, the Forest Service claims.

The stumpage price will be determined by bidding at auction, it was pointed out, but rates are subject to adjustment at 5-year intervals. The auction will be held at Washington, March 29, 1950. The lowest bid price that will be considered for timber to be used for pulp is 75 cents per cord, but the successful bidder must agree to pay certain fixed prices during the 5-year period, for timber cut for other than pulp.

Demonstrate Selective Cutting

The timber demonstration of thinning and selective cutting on the Daisy Wepfer 320 acre tract just over the Columbia county line four miles west of Stephens last week was attended by more than 125 farmers, business men and timber people as well as by some newspaper people and college men.

The project was under the general direction of Rex Carey, Forester for the International Paper Mill Company in conjunction with the Dorcheat Soil Conservation District of Columbia county with J. C. Galbraith, at its head.

The tract is grown up in old field pine, both loblolly and short leaf. It has grown so thick that many trees are crowded and stunted in growth. The timber is being cut to a stand to an average of 115 trees to the acre. There were approximately 200 trees per acre before the thinning. Each tree left standing is given room for growth at its top. No top of any pine left on the tract will be crowded. Mr. Carey explained that a tree must have top room to grow. The age of the timber was shown to be twenty-seven years. Trees that had room were far larger than those that were crowded, though the same age. One acre marked off for special demonstration had half thinned and half left for natural growth. The half thinned had 84 trees, 33 of these were cut and yielded 1½ cords pulp wood and approximately 500 feet saw logs. On the entire tract all trees large enough were cut into saw logs; the tops and smaller trees were cut into pulp wood.

Canadian Forest Products Prices

OTTAWA — The Canadian Government reports wholesale prices of total raw and partly manufactured forest products advanced to 238.9 in October, 1949, compared with 236.0 in September, 1949, though below the 259.4 of October, 1948, on the base of 1926 being 100, whereas total fully and chiefly manufactured forest products increased to 140.6 in October, 1949, as against 131.3 in September, 1949, and 133.0 in October, 1948.

Mando Provides Forestry Fellowship

MINNEAPOLIS, Minn. — The Minnesota and Ontario Paper Co. has again provided a $900 Graduate Research Fellowship in the School of Forestry at the University of Minnesota, Dr. Frank Kaufert, director of the school, announced today. Established in 1946, this Mando scholarship provides for studies concentrated on forestry problems meriting special attention. This year's scholarship, said Dr. Kaufert, will be primarily utilized to determine the extent to which certain public and private lands cut in recent years are restocking or reproducing.

Parliament Votes for Forest Research

OTTAWA—The Canadian Parliament has voted $762,990 for "forest research and investigations" and Minister of Mines and Resources, Colin Gibson, has indicated that this is for the advancement of forest conservation in Canada generally, embodying essential research to obtain and disseminate basic data in silviculture, including growth, yield and cutting methods; fire protection and forest inventories, designed to produce the optimum use and development of our forest resources on the basis of continuous production.

ASSOCIATIONS . . .

Wanted Cheering Squad

Syracuse alumni who are planning to attend the annual TAPPI Meeting in New York City, during the week of February 20, will have an opportunity to see the Syracuse University basketball team in action against City College of New York in Madison Square Garden on Thursday evening, February 23. A block of tickets will be held for a limited time. Alumni wishing to make reservations for themselves and guests should communicate with Lionel M. Sutherland, Sutherland Refiner Corp., Broad Street Bank Bldg., Trenton, N. J.

Nadelman Addresses Superintendents

KALAMAZOO, Mich. — The December meeting of the Michigan Division of The American Pulp and Paper Mill Superintendents Ass'n., Inc., held on the evening of the fifteenth at Hotel Harris, revealed a high interest in the subject of de-inking printed papers. The main speaker of the evening was Dr. A. H. Nadelman, head of Pulp and Paper School, Western Michigan College, Kalamazoo.

Dr. Nadelman, a recognized authority on the de-inking subject, prompted a most interesting discussion period by his comments on the different plastics and adhesives as well as wet strength papers that paper mills were running into in their de-inking operations. He also suggested the possibility of a continuous system of de-inking eventually taking the place of the batch method; and further related that some day it may be possible to by-pass all the fibers of a magazine not actually printed with ink.

Another feature of the meeting was a talk by Al Sherwood of Sutherland Paper Co., Kalamazoo. Having been to Europe only a short time ago, he gave his audience a log of his trip. He told of leaving Boston at 6:30 in the evening by air travel and of landing in Ireland at 1:30 the next morning. He was a passenger on the Boeing plane that broke all records for crossing the Atlantic. Its average speed, due to a heavy tail wind, was 475 miles an hour.

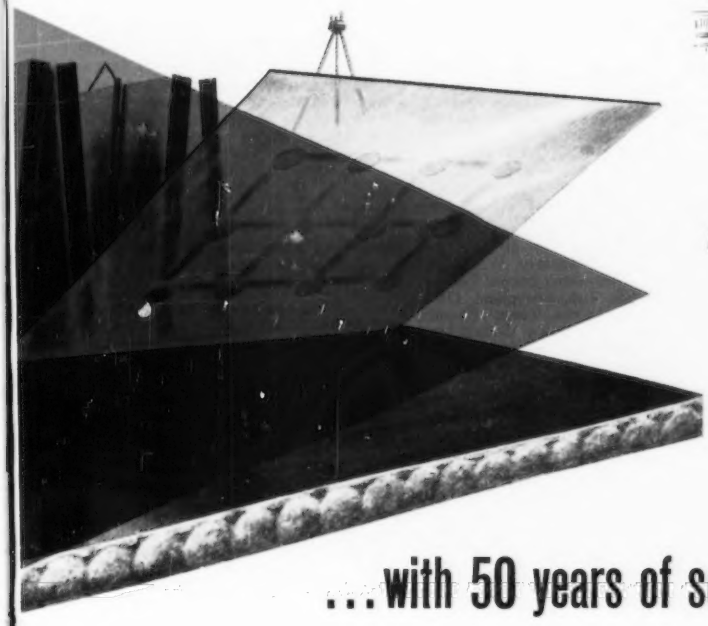
The trip was made for the purpose of examining a new set-up in printing presses. The assignment took him not only to Ireland but also to Switzerland, England and France.

William Hathaway, Kalamazoo Vegetable Parchment Co., Parchment, Kalamazoo, chairman of the Division, presided at the meeting.

Among those in attendance at the meeting were: William H. Astle, Michigan Paper Co.; D. D. Bachelder, Sutherland Paper Co.; Don Baker, St. Regis Paper Co.; Ray L. Barton, Michigan Paper Co.; Harry C. Bradford; L. H. Breyfogle, Draper Brothers Co.; William Buenger, St. Regis Paper Co.; R. E. Burkhardt, St. Regis Paper Co.; Preston D. Carter, Kalamazoo Vegetable Parchment Co.; Ralph E. Carter, Reichhold Chemical Co.; R. J. Casey, American Coating Mills; R. W. Chermak, Kalamazoo Vegetable Parchment Co.; A. W. Cole, Rex Paper Co.; John Cotton, Corn Products; J. A. Dean, Michigan Paper Co.; E. A. Dunton, French Paper Co.; Frank B. Eilers, Orr Felt & Blanket Co.; Arthur H. Fitzgerald, Archer-Daniels; Frank F. Ford, St. Regis Paper Co.; Ralph Fralich, Simplicity Co.; Ed. French, French Paper Co.; F. G. French, French Paper Co.; James H. Fritz, Nopco Chemical Co.; John O. Glendening, St. Regis Paper Co.; Nick Gian, Simplicity Pattern Co.; M. J. Goloff, St. Regis Paper Co.; W. F. Hathaway, Kalamazoo Vegetable Parchment Co.; J. A. Heenan, Sutherland Paper Co.; Leslie P. Hill, Kalamazoo Vegetable Parchment Co.; F. M. Hodgemire, Hawthorne Paper Co.; David Humphreys, Sharples Chemicals, Inc.; George A. Johnson, Kalamazoo Vegetable Parchment Co.; L. H. LaLiberte, Kalamazoo Vegetable Parchment Co.; D. W. McArthur, Reichhold Chemicals Co.; J. W. McClaran, National Starch Prdcts.; D. H. Militzer, Garrett Burgess, Inc.; Elbert G. Milham, Watervliet Paper Co.; W. B. Morehouse, Nopco Chemical Co.; H. J. Marty, Ohio Knife Co.; A. H. Nadelman, Western Michigan College; Harley Nelson, French Paper Co.; H. Nendorf, Rex Paper Co.; Harry C. Pearson, Pioneer Paper Stock Co.; R. H. Peters, St. Regis Paper Co.; Al Perlick, Kalamazoo Vegetable Parchment Co.; R. I. Rice, American Coating Mills; F. W. Schmiege, American Wire Cloth Co.; E. A. Shallcross, Sharples Corp.; C. B. Smith, Noble & Wood Machine Co.; Lyall Stafford, Hawthorne Paper Co.; Milt Stell-

as you were in 1900

Glass-making involved many arduous, cumbersome and even dangerous processes, as did such industries as soap, paper and textile manufacture, water purification and sewage treatment.



as you are today

Many new methods and improved materials take the guesswork —and the hazards —out of modern glass-making.

...with 50 years of service by Niagara Alkali

One of the world's oldest industries is very young in ideas. That's why glass-making has made such strides toward efficiency of operation, quality of products and safety of its workers in the last 50 years.

Fifty years spell progress at Niagara Alkali, too. A pioneer in American production of liquid chlorine and caustic soda, and now observing its fiftieth anniversary, Niagara has shown consistent progress by the development of new and better chemicals which, in turn, stimulate progress in the fields it serves: paper, soap, glass, textiles, sewage treatment, water purification and others.

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60 East 42nd Street, New York 17, N. Y.

Liquid Chlorine • Caustic Potash • Carbonate of Potash • Paradichlorobenzene • Caustic Soda • NIALK TRICHLORethylene

macher, Rex Paper Co.; Glen Sutton, Sutherland Paper Co.; G. T. Turula, American Coating Mills; O. C. Underhill, Ohio Knife Co.; Jack Wandtke, Calco Chemical Division; Arnold Weller, Sutherland Paper Co.; E. Wilde, St. Regis Paper Co.; A. Woolam, Goulds Pumps, Inc.; H. L. Vanderberg, A. E. Staley Mfg. Co.; Fred Chappell, Hercules Powder Co.; Al Sherwood, Sutherland Paper Co.; Carl Harding, Shuler & Benninghofen.

Lake Erie Group Meet January 20

CLEVELAND, Ohio—The fourth meeting of the Lake Erie Papermaker's and Converter's Ass'n. will be held January 20 at the Hickory Grill, 929 Chester Avenue. Cocktails will be served from 6 to 7, dinner at 7:15, and the meeting will be open promptly at 8:15. Cost of dinner will be $3.50.

H. G. Hays will talk on "What Are Poor Safety Tools Costing You?" Mr. Hays is technical consultant for Greater Cleveland Safety Council and general manager of the Ohio State Safety Council. H. P. Ferguson and M. S. Obenauf have collaborated on a paper which Mr. Ferguson will deliver, entitled "The Future Relation Between the Petroleum and Paper Industries." Both Mr. Ferguson and Mr. Obenauf are in the Refining Control Division of the Standard Oil Co. of Ohio. After these talks, the subjects will be open for discussion by members and guests.

Reservations and requests for further information should be addressed to W. Schoenberg, Sec.-Treas., LEPCA, Room 105, 1200 West 9th street, Cleveland 13, Ohio.

M.I.T. Alumni Luncheon Scheduled

NEW YORK—The Massachusetts Institute of Technology Alumni will hold their annual luncheon in connection with the TAPPI Convention at 12 noon on February 21. L. H. Flett, '18, is chairman of this year's luncheon which will again be held at the Engineer's Club, 32 W. 40th street, New York. Reservations may be made through D. F. Lowry, Penick & Ford, Ltd., Inc., 420 Lexington avenue, New York 17, N. Y.

Stovroff Named Chairman

NEW YORK—Haskell Stovroff, Buffalo Waste Paper Co., Inc., Buffalo, N. Y., has been named chairman of the National Association of Waste Material Dealers, Inc., Nominating Committee by the group's Board of Directors. Mr. Stovroff, who is a director of N.A.W.M.D. and treasurer of the Waste Paper Institute, has issued a call for a meeting to be held January 10 in the Waldorf Astoria in New York City.

Others who were named to the committee follow: Archie Rosenthal, Jos. Rosenthal's Sons, Inc., Philadelphia, Pa., member of the Metal Dealers Division Executive committee; Morton A. Friedman, L. A. Cohn & Bro., Inc., Chicago, Ill., chairman of the Mid-Western Division and a director of N.A.W.M.D.; Anthony Nicoletti D. Benedetto, Inc., New York City, president of the Cotton Bag Council, and Robert Miller, R. & V. Miller, Inc., Newark, N. J., former president of the Wool Stock Institute.

As provided by the N.A.W.M.D. bylaws, the three presidents immediately preceding the current head of the organization will serve as an advisory panel for the nominating committee and will meet with the group. The three are Sidney Danziger, H. Kramer & Co., New York City; Joseph Tyroler, Tyroler Metals, Inc., Cleveland, Ohio, and Paul Jos. White, Great Eastern Packing & Paper Stock Corp., New York City. The nominating group will pick a slate of officers and 12 directors.

A. S. A. Adds Three to Board

The American Standards Ass'n. announces election of three new members of its board of directors effective January 1, 1950, for a term of three years. Maurice Stanley, chairman of the board of the Fafnir Bearing Co., represents the Anti-Friction Bearing Mfrs. Ass'n., Inc.; B. S. Voorhees, vice-president of the New York Central System, represents the Ass'n of American Railroads; and Colonel J. G. Vincent, vice-president, Packard Motor Car Co., represents the Automobile Manufacturers Ass'n. In addition, E. E. Potter, vice-president of the General Electric Co., has been named by the National Electrical Manufacturers Ass'n. to fill out the unexpired term of Clarence L. Collens, who has just retired as chairman of the Reliance Electric and Engineering Co. Miss Ardenia Chapman, Dean of the College of Home Economics, Drexel Institute of Technology, Philadelphia, is completing the unexpired term of Mrs. Carol Willis Moffett, well known for her work with the American Home Economics Ass'n., as member-at-large.

P. E. Cooper Reelected Chairman

VANCOUVER, B. C.—Paul E. Cooper was re-elected chairman of the western branch, Canadian Pulp and Paper Association, at its annual meeting held here. He is president of Pacific Mills, Ltd. Harold S. Foley was elected vice-chairman. The western branch executive committee comprises the following: Prentice Bloedel, J. Petrie, R. S. Laird, Lawrence Killam, G. D. Humphrey, D. G. Stenstrom, J. A. Young, Harry Todd, J. G. Prentice, R. H. R. Young, M. J. Foley, Logan Mayhew, and Clifford Crispin. Leander Manley is secretary-manager.

U. of M. Alumni Luncheon Scheduled

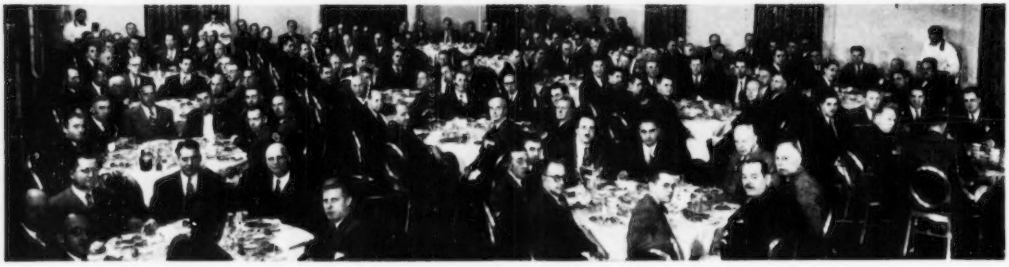
ORONO, Me. — Plans are now being made to hold the annual University of Maine pulp and paper alumni luncheon in the South Room of the Hotel Commodore, New York, Wednesday, February 22. Among those who plan to be present from the university are Alumni Secretary, John Sealey, Dean Paul Cloke, Professors Lyle C. Jenness, Edward F. Thode, John B. Calkin and John Lewis.

Miami Valley Div. to Meet Jan. 26

CHICAGO, Ill.—The next meeting of the Miami Valley Division of The American Pulp and Paper Mill Superintendents Ass'n., Inc., will be held at 7 p.m., on January 26, at the Hotel Anthony Wayne in Hamilton, Ohio.

The speaker will be Robert F. Reed of the Lithographic Technical Foundation, Chicago, Ill.

ALLIED INDUSTRIES LUNCHEON CLUB'S ANNUAL CHRISTMAS PARTY



About 150 members and guests of the Allied Industries Luncheon Club gathered for the annual Christmas party in the Main Ballroom of the Hotel Commodore in New York City. Pulp and paper mill executives from the New York vicinity were the guests of the organization whose membership consists of companies supplying materials and equipment to the Industry. Details of the party were arranged by a committee consisting of F. H. Smith, chairman, A. L. Hamm and F. Wierk, co-chairman.

BIDS—AWARDS . . .

GPO 1st Quarter, 1950 Paper Needs

WASHINGTON — Bids were received on December 19 by the Joint Congressional Committee on Printing for paper for the use of the Government Printing Office for a three-month period beginning January 1, 1950. Awards, announced December 27, are indicated by asterisks (*) before the names of the successful bidders in the tabulation herewith.

Newsprint

No. 1—1,300,000 lbs., 24x36—64; rolls, 19, 24, 36, and 48 ins. wide, 36 inches in diameter (3-inch fiber cores).

No bids.

Machine-Finish Book

No. 3—1,250,000 lbs., 25x38—70; flat, cut any size, min. width 21 ins., max. width 48 ins.

* Wilcox, Walter, Furlong Paper Co. .0899c
Fitchburg Paper Co. .1023c
The Mudge Paper Co. .1011c
Barton, Duer & Koch Paper Co. .101c
Frank Parsons Paper Co. .1063c
Walker, Goulard Plehn Co. (500,000 lbs. only) .1067c

No. 6—100,000 lbs., 25x38—70; rolls, 28½ ins. wide, 36 ins. in diameter (3-inch fiber cores).

* Wilcox, Walter, Furlong Paper Co. .0849c
Central Ohio Paper Co. .101c
The Mudge Paper Co. .0922c
Stanford Paper Co. .1082c
Barton, Duer & Koch Paper Co. .0922c
Walker, Goulard Plehn Co. .0896c

No. 7—250,000 lbs., 25x38—70; rolls, 19, and 38 ins. wide, 36 inches in diameter (3-inch fiber cores).

* Wilcox, Walter, Furlong Paper Co. .0849c
Central Ohio Paper Co. .101c
Fitchburg Paper Co. .0912c
The Mudge Paper Co. .0857c
Stanford Paper Co. .1082c
Barton, Duer & Koch Paper Co. .0922c
Walker, Goulard Plehn Co. .0896c

No. 9—150,000 lbs., 25x38—70; rolls, 24, 36, and 48 ins. wide, 36 inches in diameter (3-inch fiber cores).

* Wilcox, Walter, Furlong Paper Co. .0849c
Central Ohio Paper Co. .101c
Fitchburg Paper Co. .0912c
The Mudge Paper Co. .0857c
Barton, Duer & Koch Paper Co. .0922c

English-Finish Book

No. 10—150,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins. max. width 48 ins.

Central Ohio Paper Co. .0998c
Fitchburg Paper Co. .1026c
Stanford Paper Co. .1015c
* Barton, Duer & Koch Paper Co. .0954c

Offset Book

No. 18—250,000 lbs., 25x38—80; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

* Central Ohio Paper Co. .116c
Fitchburg Paper Co. .1172c

No. 19—1,200,000 lbs., 25x38—100; flat, cut any size, min. width, 24 ins., max. width 48 ins., the grain to run lengthwise of the sheet.

* Central Ohio Paper Co. .1091c
Fitchburg Paper Co. .1092c
Whitaker Paper Co. .1243c
Stanford Paper Co. .1108c
Frank Parsons Paper Co. .112c
* R. P. Andrews Paper Co. (500,000 lbs. only) .1035c
Walker, Goulard Plehn Co. .1375c

No. 20—150,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.

Wilcox, Walter Furlong Paper Co. .1075c
* Central Ohio Paper Co. .1008c
Fitchburg Paper Co. .1072c
Whitaker Paper Co. .1036c
Stanford Paper Co. .1108c
Walker, Goulard Plehn Co. .121c

Antique Book

No. 21—80,000 lbs., 25x38—90; flat, cut 32x42, 33x43, and 38x50 ins.

Central Ohio Paper Co. .1004c
Fitchburg Paper Co. .1026c
Stanford Paper Co. .1039c
* Barton, Duer & Koch Paper Co. .0979c
Walker, Goulard Plehn Co. .1275c

No. 22—100,000 lbs., 25x38—120; flat, cut 32x42, and 38x50 ins.

* Wilcox, Walter, Furlong Paper Co. .0923c
Central Ohio Paper Co. .0981c
Fitchburg Paper Co. .1011c
Stanford Paper Co. .1039c
Barton, Duer & Koch Paper Co. .0978c
Walker, Goulard Plehn Co. .118c

Lightweight Machine-Finish Book

No. 23—15,000 lbs., 25x38—60; flat, cut 28x38 and 38x48 ins.

No bids.

50% Antique Book

No. 26—40,000 lbs., 25x38—80; flat, cut 32x48 and 38x48 ins.

Stanford Paper Co. .1574c
Howard Paper Mills, Aetna Div. .1527c
Walker, Goulard Plehn Co. .1549c
Paper Corp. of U. S. .1553c
* John W. McNeil, Inc. .1411c
Royal Paper Corporation .1499c

No. 27—20,000 lbs., 25x38—80; shall be suitable for writing on with ink, flat, cut 22¾x31 ins.

Stanford Paper Co. .1574c
Howard Paper Mills, Aetna Div. .1527c
Walker, Goulard Plehn Co. .1549c
Paper Corp. of U. S. .1553c
* John W. McNeil, Inc. .1411c
Royal Paper Corporation .1499c

Water Resistant (Text) Book

No. 30—50,000 lbs., 25x38—120; flat, cut 32x42 and 35x45 ins.

Fitchburg Paper Co. .1524c
Stanford Paper Co. .1534c
* Frank Parsons Paper Co. .1367c
John W. McNeil, Inc. .1399c

Supercalendered Book

No. 32—350,000 lbs., 25x38—90; flat, cut any size, min. width 24 ins., max. width 48 ins.

Mudge Paper Co. .1016c
Frank Parsons Paper Co. .1014c
* Mead Sales Co. .0995c

No. 33—400,000 lbs., 25x38—90; rolls, 28½ and 38 ins. wide, 36 ins. in diameter (3-inch fiber cores).

* Mudge Paper Co. .0892c
Frank Parsons Paper Co. .0895c

Coated Book

No. 34—450,000 lbs., 25x38—100; flat, cut any size, min. width 24 ins., max. width 48 ins.

Stanford Paper Co. .0984c
Barton, Duer & Koch Paper Co. .0973c
* Frank Parsons Paper Co. .0969c

No. 35—120,000 lbs., 25x38—120; flat, cut any size, min. width 24 ins., max. width 48 ins.

Stanford Paper Co. .0984c
Barton, Duer & Koch Paper Co. .0973c
* Frank Parsons Paper Co. .0969c

No. 36—40,000 lbs., 25x38—100; rolls, 28½ and 38 ins. wide, 36 ins. in diameter (3-inch fiber cores).

Stanford Paper Co. .0861c
Barton, Duer & Koch Paper Co. .0833c
* Frank Parsons Paper Co. .08058c

No. 38—250,000 lbs., 25x38—140; flat, cut 28x41, 32x42, 38x48, 39x50, and 41x52 ins.; the grain to run lengthwise of the sheet.

Barton, Duer & Koch Paper Co. .1279c
* Mead Sales Co. .112c

Litho Coated Book

No. 41—80,000 lbs., 25x38—140; flat, cut 32x42, 35x45, 38x48, 39x50 and 41x52 ins.; the grain to run lengthwise of the sheet.

Stanford Paper Co. .1455c
* Walker, Goulard Plehn Co. (40,000 lbs. only) .143c
* Bermingham & Prosser Co. (40,000 lbs. only) .143c

Dull Coated Book

No. 42—20,000 lbs., 25x38—140; flat, cut 32x42 and 38x48 ins.; the grain to run lengthwise of the sheet.

Stanford Paper Co. .143c
* Paper Corp. of U. S. .1298c

Ground Wood Mimeograph Paper

No. 45—200,000 lbs., No. 40, flat, cut 32½x42½ ins.; the grain to run as ordered.

Stanford Paper Co. .0971c
* Frank Parsons Paper Co. .0785c
Walker, Goulard Plehn Co. .0942c
Paper Corp. of U. S. .0883c
Mead Sales Co. .089c
Royal Paper Corp. .0899c
Bulkley Dunton & Co., Inc. .08249c

Chemical Wood Mimeograph White and Colored

No. 44—1,000,000 lbs., white, No. 40. Flat, cut 28½x34½, 32½x42½, 38x48½ ins. Grain: size 28½x34½ ins., to run the 28½ inch way; size 32½x42½ to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way.

Fitchburg Paper Co. (500,000 lbs. only) .1033c
Eastern Corporation .1075c
Mudge Paper Company (100,000 lbs. only) .101c
Whitaker Paper Co. (500,000 lbs. only) .098c
Stanford Paper Co. .0944c
Barton, Duer & Koch Paper Co. .0914c
Frank Parsons Paper Co. .1015c
Walker, Goulard Plehn Co. .1121c
* Bermingham & Prosser Co. .0852c
Royal Paper Corporation .10988c

No. 45—50,000 lbs., blue, buff, green, pink, and yellow, No. 40. Flat, cut 32½x42½, and 38x48½ ins. Grain: Size 32½x42½ ins. to run the 42½ inch way; size 38x48½ ins. to run the 38 inch way. Min. order, one color, 10,000 lbs.

Eastern Corporation .1125c
Marquette Paper Corp. .115c
* Bermingham & Prosser Co. .0995c
Royal Paper Corporation .11753c

25% Mimeograph

No. 46—400,000 lbs., No. 40; Flat, cut 28½x34½, 32½x42½, 38x48½, and 40½x42½ ins. Grain: Size 28½x34½ ins. to run the 28½ inch way; sizes 32½x42½ and 40½x42½ ins. to run the 42½ inch way; size 39x48½ ins. to run the 38 inch way.

Cauthorne Paper Co. .1236c
Stanford Paper Co. .1163c
Howard Paper Mills, Aetna Div. .1107c
* Walker, Goulard Plehn Co. .1022c
Paper Corp. of U. S. .1159c

Duplicator Copy Paper, Liquid Process, White and Colored

No. 47—450,000 lbs., white, No. 40. Flat, cut 32x42, 34x44 and 40x52½ ins.; the grain to run lengthwise of the sheet.

Cauthorne Paper Co. .1186c
Fitchburg Paper Co. (250,000 lbs. only) .1132c
* Eastern Corporation .11c
Marquette Paper Corporation .1236c
Stanford Paper Co. .1162c
Frank Parsons Paper Co. .1169c
Walker, Goulard Plehn Co. .1119c

No. 48—40,000 lbs., pink, yellow, green and blue, No. 40; flat, cut 32x42, 34x44, and 40x52½ ins.; the grain to run lengthwise of the sheet.

Cauthorne Paper Co. .1261c
* Eastern Corp. .115c
Marquette Paper Corp. .1256c

Blue USMO Safety Writing

No. 49—150,000 lbs., No. 32. Rolls, 22 ins. wide, 24 ins. in diameter (3-inch fiber cores).

* Frank Parsons Paper Co. .16887c
Frank Parsons Paper Co. (50,000 lbs. only) .1695c
Frank Parsons Paper Co. .1702c
* R. P. Andrews Paper Co. (50,000 lbs. only) .1672c

* R. P. Andrews Paper Co.
(50,000 lbs. only) ..... .1682c
Walker, Goulard Plehn Co.
(50,000 lbs. only) ..... .1691c
Walker, Goulard Plehn Co.
(50,000 lbs. only) ..... .1696c
Walker, Goulard Plehn Co.
(50,000 lbs. only) ..... .1701c

Chemical Wood Writing White and Colored

No. 51—220,000 lbs., white, No. 26; flat, cut any size, min. width 21 ins., max. width 48 ins.
Central Ohio Paper Co. ..... .1137c
* Mudge Paper Co. ..... .1112c
Marquette Paper Corporation ..... .1214c
Whitaker Paper Co. ..... .1249c
Frank Parsons Paper Co. ..... .1125c
Walker, Goulard Plehn Co.
(120,000 lbs. only) ..... .1187c
Paper Corp. of U. S. ..... .1187c

No. 52—1,000,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.
Wilcox, Walter Furlong Paper Co. .0903c
Mudge Paper Co.
(200,000 lbs. only) ..... .1023c
* Whitaker Paper Co. ..... .1017c
Barton, Duer & Koch Paper Co.
(100,000 lbs. only) ..... .1042c
* Frank Parsons Paper Co.
(600,000 lbs. only) ..... .1015c
Walker, Goulard Plehn Co.
(250,000 lbs. only) ..... .1049c
Walker, Goulard Plehn Co.
(750,000 lbs. only) ..... .1149c
Old Dominion Paper Co. ..... .1104⅙c

No. 53—2,000,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.
* Mudge Paper Co.
(200,000 lbs. only) ..... .0957c
* Whitaker Paper Co.
(1,000,000 lbs. only) ..... .0963c
Whitaker Paper Co.
(1,000,000 lbs. only) ..... .0978c
Barton, Duer & Koch Paper Co.
(1,000,000 lbs. only) ..... .0982c
* Frank Parsons Paper Co.
(100,000 lbs. only) ..... .0955c
R. P. Andrews Paper Co.
(100,000 lbs. only) ..... .10c
Walker, Goulard Plehn Co.
(250,000 lbs. only) ..... .101c
Walker, Goulard Plehn Co.
(1,750,000 lbs. only) ..... .1149c
Walker, Goulard Plehn Co.
(2,000,000 lbs. only) ..... .1065c
Old Dominion Paper Co. ..... .1156⅞c

No. 54—400,000 lbs., white, No. 32. Rolls, min. width 16 ins., max. width 48 ins., 36 ins. in diameter (3-inch fiber cores).
* Wilcox, Walter, Furlong Paper Co. .0862c
Whitaker Paper Co. ..... .0870c
Stanford Paper Co. ..... .0925c
Barton, Duer & Koch Paper Co. .0962c
Frank Parsons Paper Co.
(250,000 lbs. only) ..... .0886c

No. 55—50,000 lbs., white, No. 40; rolls, min. width 16 ins., max. width 48 ins. 36 ins. in diameter (3-inch fiber cores).
Wilcox, Walter Furlong Paper Co. .0863c
Mudge Paper Co. ..... .0824c
Stanford Paper Co. ..... .09c
Barton, Duer & Koch Paper Co. .0902c
* Frank Parsons Paper Co. ..... .082oc

No. 57—180,000 lbs., blue, buff, green, pink, salmon and yellow, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins. Min. order, one color, 10,000 lbs.
Marquette Paper Corp. ..... .1186c
* Paper Corp. of U. S. ..... .1125c

No. 58—200,000 lbs., blue, buff, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins. Min. order, one color, 10,000 lbs.
Marquette Paper Corp. ..... .1172c
* Paper Corp. of U. S. ..... .1115c
Old Dominion Paper Co. ..... .1139⅞c

Chemical Wood Writing, White and Yellow

No. 60—20,000 lbs., yellow, No. 32; 38-inch rolls, 36 ins. in diameter (3-inch fiber cores).
* Walker, Goulard Plehn Co. ..... .1139c
Butler Co. ..... .118c

Chemical Wood Writing, White and Colored

No. 61—40,000 lbs., white, No. 24; rolls, 22 ins. wide, 34 to 36 ins. in diameter (3-inch fiber cores).
Stanford Paper Co. ..... .12c
* Frank Parsons Paper Co. ..... .1069c

No. 62—25,000 lbs., white, No. 30. Rolls, 22 ins. wide, 34 to 36 ins. in diameter (3-inch fiber cores).
* Stanford Paper Co. ..... .1125c

No. 65—20,000 lbs., blue, green, pink, yellow, buff, cherry, and salmon, No. 24; rolls, 22 ins. wide, 34 to 36 ins. in diameter (3-inch fiber cores).
* Stanford Paper Co. ..... .1275c

White Chemical Wood Writing

No. 64—50,000 lbs., No. 32. Rolls, 38 ins. wide 36 ins. in diameter (3-inch fiber cores).
Stanford Paper Co. ..... .0925c
* Walker, Goulard Plehn Co. ..... .0923c
Butler Co. ..... .0975c

50% Lithograph-Finish Map

No. 70—20,000 lbs., No. 32. Flat, cut any size, min. width, 22 ins., max. with 48 ins.; the grain to run lengthwise of the sheet.
* Stanford Paper Co. ..... .1472c
Barton, Duer & Koch Paper Co. .. .155c
Howard Paper Mills, Aetna Div. .. .1517c
John W. McNeil, Inc. ..... .1509c

No. 71—50,000 lbs., No. 40; flat, cut any size, min. width 22 ins., max. width, 48 ins.; the grain to run lengthwise of the sheet.
* Stanford Paper Co. ..... .1452c
Barton, Duer & Koch Paper Co. .. .152c
Howard Paper Mills, Aetna Div. .. .1477c
John W. McNeil, Inc. ..... .1477c

No. 73—175,000 lbs., No. 56. Flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet.
Mudge Paper Co. ..... .1532c
* Stanford Paper Co. ..... .1422c
Barton, Duer & Koch Paper Co. . .15c
Howard Paper Mills, Aetna Div. .. .1447c
Bermingham & Prosser Co. .. .. .1459c

High Wet Strength Map

No. 78—522,000 lbs., No. 48; flat, cut any size, min. width 22 ins., max. width 48 ins.; the grain to run lengthwise of the sheet (omit ream markers).
Cauthorne Paper Co. ..... .1474c
Central Ohio Paper Co. ..... .1514c
Fitchburg Paper Co. ..... .151c
* Stanford Paper Co. ..... .1387c
Frank Parsons Paper Co. ..... .1469c

Chemical Wood Manifold White and Colored

No. 85—60,000 lbs., white, No. 18; flat, cut 21x32, 28x34, 32x42, and 34x44 ins.
Stanford Paper Co. ..... .1242c
Frank Parsons Paper Co. ..... .1248c
R. P. Andrews Paper Co. ..... .1332c
* Walker, Goulard Plehn Co. ..... .1197c
Paper Corp. of U. S. ..... .119c
Graham Paper Co. ..... .1229c

No. 84—30,000 lbs., white, No. 18; rolls 22 ins. wide, 30 ins. in diameter (3-inch fiber cores).
Stanford Paper Co. ..... .1141c
Frank Parsons Paper Co. ..... .1198c
R. P. Andrews Paper Co. ..... .1165c
Walker, Goulard Plehn Co. ..... .1097c
* Graham Paper Co. ..... .1095c

No. 83—35,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 18. Flat, cut 28x34, 32x42 and 34x44 ins. Min. order, one color, 5,000 lbs.
Frank Parsons Paper Co. ..... .135c
* R. P. Andrews Paper Co. ..... .1387c

50% Manifold, White and Colored

No. 86—20,000 lbs., No. 14; flat, cut 32x42 ins., min. order, 10,000 lbs.
Stanford Paper Co. ..... .204c
* Barton, Duer & Koch Paper Co. .19c
R. P. Andrews Paper Co. ..... .264c
Old Dominion Paper Co. ..... .1993⅞c

No. 87—40,000 lbs., white, No. 18; flat, cut 21x32, 28x34, 32x42, and 34x44 ins.
Mudge Paper Co. ..... .1819c
Stanford Paper Co. ..... .192c
* Barton, Duer & Koch Paper Co. . .1735c
R. P. Andrews Paper Co. ..... .2635c
Paper Corp. of U. S. ..... .1857c
Old Dominion Paper Co. ..... .17399c

No. 89—15,000 lbs. blue, buff, cherry, green, pink, salmon and yellow, No. 18. Flat, cut 28x34 and 34x44 ins. Min. order, one color, 5,000 lbs.
Mudge Paper Co. ..... .1939c
Stanford Paper Co. ..... .204c
Barton, Duer & Koch Paper Co. . .187c
R. P. Andrews Paper Co. ..... .2685c
Paper Corp. of U. S. ..... .1918c
* Old Dominion Paper Co. ..... .18398c

100% White Manifold

No. 90—5,000 lbs., No. 18; flat, cut 32x42 ins. Min. order, 5,000 lbs.
Mudge Paper Co. ..... .2688c
Stanford Paper Co. ..... .287c
Barton, Duer & Koch Paper Co. .. .35c
R. P. Andrews Paper Co. ..... .385c
* Paper Corp. of U. S. ..... .2605c

50% White Glazed Manifold

No. 91—20,000 lbs., No. 16. Flat, cut 32x42 ins. Min. order, 20,000 lbs.
Mudge Paper Co. ..... .1999c
Stanford Paper Co. ..... .207c
* Barton, Duer & Koch Paper Co. . .19c
R. P. Andrews Paper Co. ..... .2875c
Paper Corp. of U. S. ..... .1908c

Chemical Wood Bond White

No. 102—150,000 lbs., white, No. 40; flat, cut any size, min. width 21 ins., max. width 38 ins.
Wilcox, Walter, Furlong Paper Co. .115c
Central Ohio Paper Co. ..... .1153c
Eastern Corporation ..... .1075c
Marquette Paper Corp. ..... .1186c
Whitaker Paper Co. ..... .1249c
* Stanford Paper Co. ..... .1039c
Barton, Duer & Koch Paper Co. . .1125c
R. P. Andrews Paper Co. ..... .113c
Walker, Goulard Plehn Co. ..... .1247c

Chemical Wood White Mimeograph Bond

No. 104—30,000 lbs., No. 40; flat, cut 32½x42½ ins.; the grain to run lengthwise of the sheet
Eastern Corporation ..... .1075c
Marquette Paper Corp. ..... .1188c
Whitaker Paper Co. ..... .1249c
* R. P. Andrews Paper Co. ..... .113c
Walker, Goulard Plehn Co. ..... .1247c

25% Bond, White and Colored

No. 105—80,000 lbs., white, No. 26. Flat, cut any size, min. width 21 ins., max. width 48 ins.
Mudge Paper Co. ..... .1524c
* Barton, Duer & Koch Paper Co. . .1465c
Howard Paper Mills, Aetna Div. .. .1497c

No. 106—700,000 lbs., white, No. 32; flat, cut any size, min. width 21 ins., max. width 48 ins.
* Howard Paper Mills, Aetna Div.
(400,000 lbs. only) ..... .1308c
Howard Paper Mills, Aetna
(300,000 lbs. only) ..... .1323c
R. P. Andrews Paper Co.
(150,000 lbs. only) ..... .1499c
* Butler Co.
(200,000 lbs. only) ..... .1314c
* Butler Co.
(200,000 lbs. only) ..... .1323c
Butler Co.
(300,000 lbs. only) ..... .1334c

No. 109—500,000 lbs., No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.
* Howard Paper Mills, Aetna Div.
(300,000 lbs. only) ..... .1263c
Howard Paper Mills, Aetna Div.
(200,000 lbs. only) ..... .1273c
R. P. Andrews Paper Co.
(150,000 lbs. only) ..... .1444c
* Bermingham & Prosser Co.
(250,000 lbs. only) ..... .1272c
Bermingham & Prosser Paper Co.
(250,000 lbs. only) ..... .1291c

No. 110—40,000 lbs., No. 32, white, rolls, 21 and 26 ins. wide, 36 ins. in diameter (3-inch fiber cores).
Stanford Paper Co. ..... .1298c

Barton, Duer & Koch Paper Co. . .14c
* Howard Paper Mills, Aetna Div. . .1273c

No. 112—20,000 lbs., cherry, green, pink, and yellow, No. 32; rolls 26 ins. wide, 36 ins. in diameter (3-inch fiber cores).
* Stanford Paper Co. 1354c
Barton, Duer & Koch Paper Co. . .147c
Howard Paper Mills, Aetna Div. . .1393c

No. 113—20,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 20. Flat, cut 34x44 ins., min. order 5,000 lbs.
* Howard Paper Mills, Aetna Div. . .1597c
Butler Co. 1636c

No. 114—100,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 32. Flat, cut any size, min. width 21 ins., max. width 48 ins.
Mudge Paper Co. 1373c
* Howard Paper Mills, Aetna Div. . .1367c

No. 115—40,000 lbs., blue, buff, cherry, green, pink, salmon and yellow, No. 40; flat, cut any size, min. width 21 ins., max. width 48 ins.
Stanford Paper Company 1339c
* Howard Paper Mills, Aetna Div. . .1323c

25% Opacified Bond Paper

No. 116—40,000 lbs., white, No. 32; flat, cut 32x42 and 38x48 ins.
Stanford Paper Company 164c
* Barton, Duer & Koch Paper Co. . .152c
Frank Parsons Paper Co. 1649c
Howard Paper Mills, Aetna Div. . .1537c
John W. McNeil, Inc. 1548c

100% White Bond

No. 130—10,000 lbs., No. 40; flat, cut any size, min. width 16 ins., max. width 38 ins. Min. order, 2,000 lbs.
Mudge Paper Co. 244c
Stanford Paper Co. 26c
Barton, Duer & Koch Paper Co. . . .245c
* Frank Parsons Paper Company 2349c
R. P. Andrews Paper Corp. 2462c

Chemical Wood White Ledger

No. 150—120,000 lbs., No. 48. Flat, cut any size, min. width 17 ins., max. width 48 ins.
Wilcox, Walter Furlong Paper Co. .1132c
Canthorne Paper Co. 1287c
Central Ohio Paper Co. 1147c
Eastern Corporation 1125c
Marquette Paper Corp. 1216c
Whitaker Paper Co. 1129c
* Stanford Paper Co. 1028c
Walker, Goulard Plehn Co. 1147c
Paper Corp. of U. S. 108c

No. 151—25,000 lbs., No. 64; flat, cut any size, min. width 17 ins., max. width 48 ins.
Wilcox, Walter Furlong Paper Co. .1132c
Eastern Corp. 1125c
Marquette Paper Corp. 1216c
Whitaker Paper Co. 1129c
* Stanford Paper Co. 1028c
Walker, Goulard Plehn Co. 1087c
Paper Corp. of U. S. 108c

No. 155—20,000 lbs., No. 88. Flat, cut any size, min. width 17 ins., max. width 48 ins.
Wilcox, Walter Furlong Paper Co. .1132c
Eastern Corp. 1125c
Marquette Paper Corp. 1216c
* Stanford Paper Co. 1028c
Walker, Goulard Plehn Co. 1087c

25% Ledger, White and Colored

No. 154—160,000 lbs., white, No. 48; flat, cut 28x34, 32x42, 34x44, and 38x48 ins. Min. order, 10,000 lbs.
* Stanford Paper Co. 1298c
Frank Parsons Paper Co. 1339c
Howard Paper Mills
Aetna Division 1319c
Bermingham & Prosser Co.
(80,000 lbs. only) 1322c
Bermingham & Prosser Co.
(80,000 lbs. only) 1341c

No. 155—70,000 lbs., white, No. 64; flat, cut 28x34, 32x42, 34x44, and 38x48 ins. Min. order 10,000 lbs.
Baxter Paper Co. 1315c
* Stanford Paper Co. 1308c
Howard Paper Mills, Aetna Div. . .1329c
Butler Co. 1329c

No. 157—50,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 64. Flat, cut 34x44 ins. Min. order, one color, 10,000 lbs.
Baxter Paper Co. 1439c
Mudge Paper Co. 1369c
* Stanford Paper Co. 1348c
Barton, Duer & Koch Paper Co. .14c
Howard Paper Mills, Aetna Div. . .1367c

No. 158—10,000 lbs., blue, buff, cherry, green, pink, salmon, and yellow, No. 88; flat, cut 34x44 ins., min. order, one color, 10,000 lbs.
Baxter Paper Co. 1364c
* Stanford Paper Co. 1358c
Barton, Duer & Koch Paper Co. . .14c
Howard Paper Mills, Aetna Div. . .1397c

100% White Ledger

No. 176—15,000 lbs., No. 48. Flat, cut 28x34, 32x42 and 34x44 ins. Min. order, 4,000 lbs.
Mudge Paper Co. 2449c
Stanford Paper Co. 265c
* Barton, Duer & Koch Paper Co. . .24c
Frank Parsons Paper Co. 2405c
R. P. Andrews Paper Co. 2587c

No. 177—15,000 lbs., No. 64; flat, cut 28x34, 32x42, and 34x44 ins., min. order, 10,000 lbs.
Mudge Paper Co. 2449c
Stanford Paper Co. 265c
* Barton, Duer & Koch Paper Co. . .24c
Frank Parsons Paper Co. 2405c
R. P. Andrews Paper Co. 2587c

Chemical Wood, White and Colored Index

No. 182—200,000 lbs., white, 25½x30½—220; flat, cut 32x42 and 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.
Wilcox, Walter Furlong Paper Co. .1082c
Central Ohio Paper Co. 1035c
Whitaker Paper Co. 1029c
Stanford Paper Co. 103c
Barton, Duer & Koch Paper Co. . .105c
* Frank Parsons Paper Co. 1004c
Walker, Goulard Plehn Co. 1044c

No. 185—10,000 lbs., white, 25½x30½—280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.
Wilcox, Walter Furlong Paper Co. .1082c
Barton, Duer & Koch Paper Co. . . .1075c
* Walker, Goulard Plehn Co. 1075c

No. 185—30,000 lbs., buff, single-ply; 25½x30½—220; flat, cut 32x42 ins., with projecting colored-paper marker between each 100 sheets.
* Wilcox, Walter, Furlong Paper Co. .1102c
Marquette Paper Corp. 1141c
Stanford Paper Co. 1162c
Barton, Duer & Koch Paper Co. . .114c
Walker, Goulard Plehn Co. 1136c

50% Index, White and Colored

No. 188—200,000 lbs., white, 25½x30½—220; flat, cut 32x42 and 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.
* Barton, Duer & Koch Paper Co. . .1294c
Howard Paper Mills, Aetna Div. . .1362c
Walker, Goulard Co. 1318c

No. 189—10,000 lbs., white, 25½x30½—280; flat, cut 32x42 and 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.
* Barton, Duer & Koch Paper Co. . .1325c
Howard Paper Mills, Aetna Div. . .1412c
Walker, Goulard Plehn Co. 1338c

No. 191—150,000 lbs., blue, buff, cherry, fawn, green, pink, salmon, and yellow; 25½x30½—220; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, 10,000 lbs.
* Barton, Duer & Koch Paper Co. . .134c
Howard Paper Mills, Aetna Div. . .1407c
Walker, Goulard Plehn Co. 1368c

No. 192—35,000 lbs., blue, buff, cherry, fawn, green, pink, salmon, and yellow; 25½x30½—280; flat, cut 34x44 ins., with projecting colored-paper marker between each 100 sheets. Min. order, one color, 10,000 lbs.
Howard Paper Mills, Aetna Div. .1457c
Walker, Goulard Plehn Co. 1388c
* Barton, Duer & Koch Paper Co. . .1370c

100% White Index

No. 196—50,000 lbs., 25½x30½—250; flat, cut 20½x50 ins.
* Barton, Duer & Koch Paper Co. . .2372c
R. P. Andrews Paper Co. 2473c

Coated Cover, White and Colored

No. 200—25,000 lbs., white, 20x26—120; flat, cut 26½x41 and 34x44 ins.; the grain to run lengthwise of the sheet. Min. order, 10,000 lbs.
* Butler Co. 14c

Antique-Finish Cover, White and Colored

No. 202—50,000 lbs., white, 20x26—100. Flat, cut 25¼x39 inches.
Wilcox, Walter Furlong Paper Co. .1167c
Eastern Corp. 11c
Marquette Paper Corp. 11c
Stanford Paper Co. 125c
R. P. Andrews Paper Co. 119c
Walker, Goulard Plehn Co. 1049c
* Paper Corp. of U. S. 101c

No. 203—100,000 lbs., 20x26—100; blue, buff, dawn, quaker drab, terra cotta, gray, brown, green, gobelin blue, granite, tea, and canary; flat, cut 25¼x39 inches. Min. order, one color, 10,000 lbs.
Eastern Corp. 115c
Marquette Paper Corporation 115c
Stanford Paper Co. 13c
R. P. Andrews Paper Co. 119c
* Walker, Goulard Plehn Co. 1119c

50% Laid Cover, Colored

No. 206—50,000 lbs., blue, cream, white, gray, and green; 20x26—130; flat, cut 25¼x39 and 28x41 inches. Min. order, one color, 2,000 lbs.
Mudge Paper Co. 1672c
Frank Parsons Paper Co. 1675c
R. P. Andrews Paper Co. 1697c
* Paper Corp. of U. S. 1636c

Wood Manila

No. 208—100,000 lbs., 24x36—80; flat, cut 25x38, and 32x42 ins.
Whitaker Paper Co. 0765c
Stanford Paper Co. 0694c
Barton, Duer & Koch Paper Co. .069c
* Frank Parsons Paper Co. 0689c
Walker, Goulard Plehn Co. 0903c
Mead Sales Co. 0825c
Bulkley Dunton, Inc. 07998c

No. 210—80,000 lbs., 24x36—80; rolls, 21 ins. wide, 34 to 36 ins. in diameter. (3-inch fiber cores).
Whitaker Paper Co. 0665c
* Stanford Paper Co. 0617c
Barton, Duer & Koch Paper Co. . .062c
Frank Parsons Paper Co. 0624c
Walker, Goulard Plehn Co. 0787c
Mead Sales Co. 075c
Bulkley Dunton & Co., Inc. 07249c

No. 2 Kraft

No. 218—10,000 lbs., 24x36—80; flat, cut any size, in wrapped bundles.

No. 218—50,000 lbs., 24x36—120; flat, cut any size, in wrapped bundles.

No. 218—25,000 lbs., 24x36—140; flat, cut any size, in wrapped bundles.

No. 218—40,000 lbs., 24x36—160; flat, cut any size, in wrapped bundles.
* Cauthorne Paper Co. 0679c
Whitaker Paper Co. 0686c
R. P. Andrews Paper Co. 0693c
Arlington Sales Agency, Inc. 075c

No. 219—20,000 lbs., 24x36—100; cut any size, folded (25 sheets per fold), in wrapped bundles.

No. 219—15,000 lbs., 24x36—160; cut any size, folded (25 sheets per fold), in wrapped bundles.
* Cauthorne Paper Co. 0704c
Whitaker Paper Co. 071c
R. P. Andrews Paper Co. 0718c
Arlington Sales Agency, Inc. 075c

No. 220—80,000 lbs., 24x36—100; rolls, min. width 9 ins., max. width 48 ins., min. diameter of rolls 15 ins., max. diameter 36 ins., as may be specified with order, wound on wooden plugs, 1½-inch hole, or on 3-inch fiber cores as may be specified.

No. 220—10,000 lbs., 24x36—160; rolls, min. width 9 ins., max. width 48 ins., min. diameter of rolls 15 ins., max. diameter 36 ins., as may be

specified with order, wound on wooden plugs, 1½-inch hole, or on 3-inch fiber cores as may be specified.

* Cauthorne Paper Co. ..... .0629c
Whitaker Paper Co. ..... .0637c
R. P. Andrews Paper Co. ..... .0643c
Arlington Sales Agency, Inc. ..... .07c

White Gummed

No. 252—200,000 sheets (ungummed), No. 36; flat, cut 22x34 ins. Min. order, 25,000 sheets.

Mudge Paper Co. (per M sheets) $19.88
Whitaker Paper Co.
(per M sheets) $23.67
Stanford Paper Co. (per M sheets) $23.79
R. P. Andrews Paper Co.
(per M sheets) $19.48
Paper Corp. of U. S.
(per M sheets) $19.49
Butler Co. (per M sheets) $20.47
Eureka Specialty Printing Co.
(per M sheets) $20.16
Old Dominion Paper Co.
(per M sheets) $19.386
* Bulkley Dunton & Co., Inc.
(per M sheets) $19.109

25% Blotting, White

No. 254—10,000 lbs., 19x24—160; flat, cut 19x24 ins., in wrapped bundles. Min. order, 10,000 lbs.

Central Ohio Paper Co. ..... .1395c
Marquette Paper Corp. ..... .14c
Whitaker Paper Company ..... .1368c
Stanford Paper Co. ..... .1375c
Barton, Duer & Koch Paper Co. .1215c
R. P. Andrews Paper Co. ..... .1408c
Walker, Goulard Plehn Co. ..... .1215c
Butler Co. ..... .141nc
* Mathers Lamm Paper Co. ..... .12c
Graham Paper Co. ..... .1388c
Old Dominion Paper Co. ..... .12098c
Bulkley Dunton & Co., Inc. ..... .1395c

Desk Blotting, Colored

No. 255—20,000 lbs., moss green, 19x24—200; flat, cut 19x24 ins., in wrapped bundles, min. order, 10,000 lbs.

Central Ohio Paper Co. ..... .1185c
L. Hyman & Sons ..... .1188c
* Marquette Paper Co. ..... .115c
Whitaker Paper Co. ..... .1274c
Stanford Paper Co. ..... .1165c
Barton Duer & Koch ..... .1175c
R. P. Andrews Paper Co. ..... .118c
Walker Goulard Plehn Paper Co... .1175c
Butler Co. ..... .12c
Mathers Lamm Paper Co. ..... .115c
Graham Paper Co. ..... .1175c
Old Dominion Paper Co. ..... .11714c
Bulkley Dunton & Co., Inc. ..... .118c

High-Finish Chemical Wood Manila Tag

No. 271—20,000 lbs., 24x36—280; flat, cut 28x34 and 38x48 ins.

R. P. Andrews Paper Co. ..... .0896c
Walker Goulard Plehn Co. ..... .1173c
* Paper Corp. of U. S. ..... .089c

Jute Tag

No. 280—10,000 lbs., 22½x28½—200; flat, cut 34x44 ins., min. order, 10,000 lbs.

* R. P. Andrews Paper Co. ..... .1532c
Walker Goulard Plehn Co. ..... .17c
Paper Corp. of U. S. ..... .155c

No. 281—10,000 lbs., 22½x28½—280; flat, cut 34x44 ins., min. order, 10,000 lbs.

* R. P. Andrews Paper Co. ..... .1532c
Walker Goulard Plehn Co. ..... .17c
Paper Corp. of U. S. ..... .155c

Manila Board

No. 282—15,000 lbs., 22½x28½—400; flat, cut 22x34 ins., with projecting colored-paper marker between each 100 sheets. Min. order, 10,000 lbs.

* Paper Corp. of U. S. ..... .096c

Railroad Board, White and Colored

No. 301—15,000 lbs., white, flat, 22x34 ins., 4-ply, each 100 sheets fully banded, min. order, 10,000 sheets.

Paper Corp. of U. S.
(per M sheets) $51.70
Old Dominion Paper Co.
(per M sheets) $51.989
* Bulkley Dunton & Co., Inc.
(per M sheets) $51.44

No. 302—5,000 lbs., white, flat, 22x34 ins., 8-ply, each 100 sheets fully banded, min. order, 5,000 sheets.

Paper Corp. of U. S.
(per M sheets) $75.25
Old Dominion Paper Co.
(per M sheets) $75.49
* Bulkley Dunton & Co., Inc.
(per M sheets) $74.79

No. 304—10,000 lbs., ash gray, green, orange, and red. Flat, 22x34; 4-ply, each 100 sheets fully banded. Min. order, one color, 5,000 sheets.

* Old Dominion Paper Co.
(per M sheets) $67.49
Bulkley Dunton & Co., Inc. $66.77

Wood Cardboard, Colored

No. 306—100,000 lbs., buff; 22½x28½—150; rolls, 20 ins. wide, 36 ins. in diameter (3-inch fiber cores).

Whitaker Paper Co. ..... .0862c
Barton, Duer & Koch Paper Co... .0686c
* Frank Parsons Paper Co. ..... .0669c
Walker, Goulard Plehn Co. ..... .0736c
Bermingham & Prosser Co. ..... .0732c
Paper Corp. of U. S. ..... .0726c

No. 307—80,000 lbs., 22½x28½—150; buff, flat, cut 32x42 ins.

Whitaker Paper Co. ..... .082c
Barton, Duer & Koch Paper Co... .0736c
Frank Parsons Paper Co. ..... .0759c
Walker, Goulard Plehn Co. ..... .088c
Bermingham & Prosser Co. ..... .0807c
* Paper Corp. of U. S. ..... .0726c

No. 308—10,000 lbs., melon, 22½x28½—184; flat, cut 20x30 ins.

* Bermingham & Prosser Co. ..... .0807c

No. 309—120,000 lbs., blue, buff, green, melon, pink, and yellow; 22½x28½—184. Rolls, 20 ins. wide, 36 ins. in diameter (3-inch fiber cores).

Whitaker Paper Co. ..... .07375c
Barton, Duer & Koch Paper Co.... .0725c
Walker, Goulard Plehn Co. ..... .0736c
* Bermingham & Prosser Co. ..... .0732c

Chemical Wood Tan Board

No. 310—60,000 lbs., 22½x28½—200; flat, cut 25x38, 28x38, and 34x44 inches.

Whitaker Paper Co. ..... .1096c
Stanford Paper Co. ..... .1106c
* R. P. Andrews Paper Co. ..... .1087c
Walker, Goulard Plehn Co. ..... .1122c
Paper Corp. of U. S. ..... .1098c

United States Postal Card Paper

No. 325—6,000,000 lbs., 22½x28½—188; rolls, 33 ins. wide, 36 ins. in diameter (6-inch iron or metal capped returnable fiber cores).

* Whitaker Paper Co.
(2,000,000 lbs. only) ..... .0814c
Whitaker Paper Co.
(2,000,000 lbs. only) ..... .0837c
Whitaker Paper Co.
(2,000,000 lbs. only) ..... .0844c
* Frank Parsons Paper Co.
(2,000,000 lbs. only) ..... .0799c
* R. P. Andrews Paper Co.
(2,000,000 lbs. only) ..... .0812c
* Walker, Goulard Plehn Co.
(1,000,000 lbs. only) ..... .0817c

No. 327—100,000 lbs., 22½x28½—188; rolls, 22 ins. wide, 36 ins. diameter (6-inch iron or metal capped returnable fiber cores).

* Whitaker Paper Co. ..... .0814c

Pressboard, Colored

No. 351—5,000 lbs., red, flat, cut 30x36 ins., thickness .0140 in., min. order, 5,000 sheets.

Barton, Duer & Koch Paper Co.
(per hundred sheets) $17.50
* R. P. Andrews Paper Co.
(per hundred sheets) $13.50

No. 352—20,000 lbs., gray, flat, cut 30x36 ins., thickness .0300 inch. Min. order 5,000 sheets.

* Barton, Duer & Koch Paper Co.
(per hundred sheets) $24.50
R. P. Andrews Paper Co.
(per hundred sheets) $31.22

Newsboard

No. 360—170,000 lbs., 26x38; No. 100; flat, cut any size, min. width 21 ins., max. width 40 ins. (To be guillotine-trimmed square on four sides).

Mead Board Sales Co. ..... .0387c
Mudge Paper Co. ..... .03365c
Stanford Paper Co. ..... .0333c
R. P. Andrews Paper Co. ..... .03345c
Paper Corp. of U. S. ..... .0337c
Pulp & Paper Trading Co. ..... .03335c
Resolute Paper Products Co. .... .03432c
Old Dominion Paper Co. ..... .03369c
* Whitaker Paper Co. ..... .3273c

Binder's Board, No. 1 Quality

No. 366—30,000 lbs., No. 1, 25¼x30¼ ins., Nos. 16, 18, 20, 25, 30, and 40; flat, to trim 25x30 ins.

Mudge Paper Co. ..... .0365c
* Barton, Duer & Koch Paper Co. . .06c
R. P. Andrews Paper Co. ..... .06c

No. 367—15,000 lbs., 25¼x30¼ ins., Nos. 12 and 20, flat, to trim 34x44 ins.

Mudge Paper Co. ..... .0365c
* R. P. Andrews Paper Co. ..... .06c

Chestnut Cover Board

No. 369—40,000 lbs., 25¼x30¼; flat, to trim 25x30 inches. Nos. 17, 19, 21, 25, 31, and 41.

* Mead Board Sales Co. (No. 41) . .05725c
* Mead Board Sales Co. (all others) .0535c

No. 370—40,000 lbs., 25¼x30¼, Nos. 16, 19, 24, and 31. Flat, to trim 25¼x37¼ ins.

* Mead Board Sales Co. ..... .0535c

GPO Printing and Binding Needs First Half of 1950

WASHINGTON — Bids were received by the U. S. Government Printing Office, Office of the Public Printer, on November 23 for furnishing paper boxes, cartons and containers, for the use of the GPO. The materials are specified in "Proposal for Material for the Public Printing and Binding for the Term of Six Months, Beginning January 1, 1950." Awards announced on December 27 are indicated by asterisks before the names of successful bidders in the following tabulation:

Postal-Card Carton Boxes

No. 211—1,000,000 lbs., Cartons, "C", 5⅝ by 5¼ by 3¼ inches, inside dimensions, openings to be on the 5⅝ by 5¼-inch sides; to be securely wrapped and tied in packages of 300 cartons each (sample required to show construction of carton.) Sample will be furnished to bidder upon request, to show style of cut desired on notched top and bottom flaps. ..... per M

Karbon Box Company $5.95
Container Corporation of America .. 8.40
Climax Manufacturing Company 7.70
United Board & Carton Corporation . 8.05
Killian Folding Box Company 6.85
* Rogers Printing Company 6.52

No. 212—100,000 lbs., Cartons, "B", 6⅝ by 5⅜ by 2⅝ inches, inside dimensions, openings to be on the 6⅝ by 5⅜-inch sides; to be securely wrapped and tied in packages of 300 cartons each (sample required to show construction of carton). Sample will be furnished to bidder upon request, to show style of cut desired on notched top and bottom flaps. ..... per M

Karbon Box Company $7.00
Container Corporation of America .. 9.65
Climax Manufacturing Company 8.35
United Board & Carton Corporation . 10.60
Killian Folding Box Company 6.95
* Rogers Printing Company 7.48

Corrugated Fiber Postal-Card Shipping Containers, Card Containers

No. 213—1,500 lbs., Containers, No. 1, 27¼ by 11¼ by 6¼ inches, inside dimensions, openings

"Let's get together tomorrow and talk over our new line of stationery"

"How's ten o'clock for you? Brown Company's man is due at the office then"

Fine stationery is based on richness of appearance and delicacy of texture. To achieve these finest details, an unusual cellulose fibre is required.

Brown Company's Solka* fibres have been custom built for delicate jobs of this nature.

Assisting in developing paper making techniques to obtain the maximum out of these specialized fibres is an important part of our service. Tremendous raw material sources and over 100 years of practical experience make a difference—as your finished product will show. Brown Company will be happy to serve you from any of the offices below.

BROWN COMPANY

Foremost Producers of Purified Cellulose

Pulp Sales Offices

500 Fifth Avenue, New York 18, N. Y.
465 Congress Street, Portland 3, Maine
110 S. Dearborn Street, Chicago 3, Illinois
58 Sutter Street, San Francisco 4, California
Brown Corporation, 906 Sun Life Bldg., Montreal 2, P. Q., Canada

*®

to be on the 37½ by 11¼-inch sides; to be tied in unwrapped packages of 25 containers each.

	per M
D. A. Horn Company	$134.95
Union Paper Bag Corporation	110.00
Allcraft Container Corporation	129.00
Standard Corrugated Case Co.	121.10
United Container Company	$116.05
J & J Corrugated Box Corporation	122.40
Eastern Box Company	120.50
Kieckhefer Container Company	108.30
Verneo Specialties Company	115.90
* Container Corp. of America	98.40

No. 214—50,000 lbs., Containers No. 2, 17⅛ by 11¾ by 10⅝ inches, inside dimensions, openings to be on the 17⅛ by 11¾-inch sides; to be tied in unwrapped packages of 25 containers each.

	per M
D. A. Horn Company	$100.95
Union Paper Bag Corporation	94.55
Allcraft Container Corporation	108.00
Standard Corrugated Case Company	94.87
United Container Company	94.20
J & J Corrugated Box Corporation	88.10
Eastern Box Company	103.50
Kieckhefer Container Company	89.10
Verneo Specialties Company	97.40
* Container Corp. of America	84.60

No. 215—20,000 lbs., Containers, No. 3, 17⅛ by 11¾ by 5¼ inches, inside dimensions, openings to be on the 17⅛ by 11¾-inch sides; to be tied in unwrapped packages of 25 containers each.

	per M
D. A. Horn Company	$79.95
Union Paper Bag Corporation	72.85
Allcraft Container Corporation	78.00
Standard Corrugated Case Company	74.35
United Container Company	71.85
J & J Corrugated Box Corporation	79.90
Eastern Box Company	78.80
Kieckhefer Container Company	68.60
Verneo Specialties Company	75.20
* Container Corp. of America	64.70

No. 216—1,000 lbs., Containers, No. 5, 13½ by 11¾ by 5¾ inches, inside dimensions, openings to be on the 13½ by 11¾-inch sides; to be tied in unwrapped packages of 25 containers each.

	per M
D. A. Horn Company	$87.95
Union Paper Bag Corporation	63.35
Allcraft Container Corporation	80.00
Standard Corrugated Case Company	64.75
United Container Company	76.15
J & J Corrugated Box Corporation	76.70
Eastern Box Company	75.00
Kieckhefer Container Company	71.10
Verneo Specialties Company	67.95
* Container Corp. of America	63.05

No. 217—5,000 lbs., Containers, No. 7, 11 by 5¾ by 6¾ inches, inside dimensions, openings to be on the 11 by 5¾-inch sides; to be tied in unwrapped packages of 25 containers each.

	per M
Container Corporation of America	$34.85
D. A. Horn Company	44.95
* Union Bag & Paper Co.	32.55
Allcraft Container Corporation	45.00
Standard Corrugated Case Company	33.15
United Container Company	39.10
J & J Corrugated Box Corporation	40.15
Eastern Box Company	38.50
Kieckhefer Container Company	38.10
Verneo Specialties Company	34.85

No. 219—10,000 lbs., Containers, No. 11, 14 by 13½ by 11¼ inches, inside dimensions, openings to be on the 14 by 13½-inch sides; to be tied in unwrapped packages of 25 containers each.

	per M
* Container Corporation of America	$91.25
D. A. Horn Company	107.95
Union Paper Bag Corporation	99.00
Standard Corrugated Case Company	103.55
United Container Company	101.40
J & J Corrugated Box Corporation	108.10
Eastern Box Company	111.50
Kieckhefer Container Company	96.90
Verneo Specialties Company	105.30

Sheet Postal-Card Shipping Containers

No. 220—25,000 lbs., Containers No. 12, inside dimensions 32¾ by 22⅛ by 25⅛ inches with due allowance for the thickness of the inside pads; to be tied in packages of 25 containers each. Two pads must be supplied for each container, to be tied in packages of 25 each.

	per M
Eastern Box Company	$309.50
* Verneo Specialties Company	283.50

Corrugated Containers

No. 227—225,000 lbs., Containers, 16½ inches by 11 inches by 9¾ inches inside dimensions, openings to be in the 16½ inches by 11 inches sides; to be tied in unwrapped bundles of 25 containers each.

	per M
Eastern Box Company	$88.00
Kieckhefer Container Company	82.70
Verneo Specialties Company	84.65
* Container Corporation of America	77.60
D. A. Horn Company	96.00
Union Paper Bag Corporation	85.50
Allcraft Container Corporation	95.00
Standard Corrugated Case Company	87.62
United Container Company	83.30
J & J Corrugated Box Corporation	80.60

No. 228—250,000 lbs., Containers, 18½ inches by 12½ inches by 7 inches, inside dimensions, openings to be on the 18½ inches by 12½ inches sides; to be tied in unwrapped bundles of 25 containers each.

	per M
Eastern Box Company	$92.00
Kieckhefer Container Company	85.55
Verneo Specialties Company	89.80
* Container Corporation of America	80.50
D. A. Horn Company	100.00
Union Paper Bag Corporation	91.50
Allcraft Container Corporation	98.00
Standard Corrugated Case Company	91.90
United Container Company	89.00
J & J Corrugated Box Corporation	83.95

Solid Fiber Containers

No. 229—75,000 lbs., Containers, 16½ inches by 11 inches by 9¾ inches inside dimensions, openings to be on the 16½ inches by 11 inches sides; to be tied in unwrapped bundles of 25 containers each.

Container Corporation of America	$134.00
D. A. Horn Company	174.47
* United Container Company	129.35
Eastern Box Company	157.50
Kieckhefer Container Company	142.65

No. 230—50,000 lbs., Containers, 18½ inches by 12½ inches by 7 inches, inside dimensions, openings to be on the 18½ inches by 12½ inches sides; to be tied in unwrapped bundles of 25 containers each.

Eastern Box Company	$156.00
Kieckhefer Container Company	157.65
Container Corporation of America	146.40
D. A. Horn Company	184.13
* United Container Company	138.00

Miscellaneous

No. 237—75,000 lbs., corrugated Mailing Board, 38 by 38 inches, double-faced, kraft or chip. Bursting strength average not less than 60 points; thickness of corrugating medium average .009 inch; normal thickness ⅛ inch, tied in bundles of 25 sheets each (sample required).

	per sheet
Eastern Box Company	$91.50
Verneo Specialties Company	83.00
Standard Corrugated Case Company	70.75
* United Container Company	68.50

SUPPLIERS . . . . .

MILWAUKEE, Wis.—The Allis-Chalmers Mfg. Co. is preparing a proposed retirement plan for all of its 30,000 employes, it has been announced by the company. It is also studying improvements in its health and accident plan recently suggested by the West Allis Works Mutual Aid Society. The mutual aid societies are operated locally at each plant, with the company matching employe's contributions.

RALPH E. GIBBS

R. E. Gibbs In Private Practice

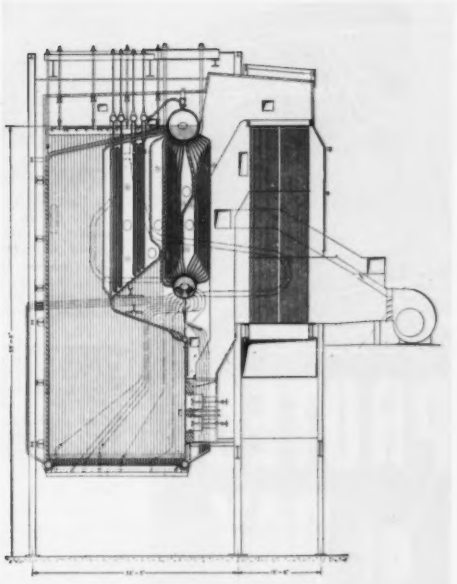
YORK, Pa.—Ralph E. Gibbs recently returned to his practice as a consulting chemical engineer specializing in rotary kiln operations. Since 1945 he has been engaged as research director for York-Shipley, Inc., besides devoting considerable time to writing articles for technical and semi-technical publications.

Prior to 1945, Mr. Gibbs, in the capacity of a consultant, worked on many lime and CO_2 recovery projects throughout the country. During this time he worked closely with the late W. R. Cliffe, noted expert in the lime and lime-recovery field.

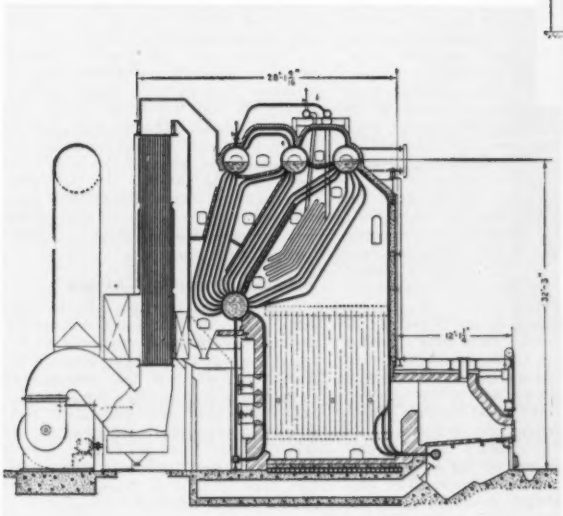
From 1923 to 1942, Mr. Gibbs held positions as chief chemist for the York Corp., and technical director of kiln operations in the field of lime and refractory dolomite manufacture. In this work he made extensive studies on the operation of rotary kilns and developed new principles of thermodynamics as applied to calcination, readily applicable to the lime-recovery plants of the paper industry. Mr. Gibbs was graduated from Pennsylvania State College in 1921 with a B.S. in Electrochemical Engineering.

American Brake Shoe Co. reports that Paul L. McCulloch, Jr., has been transferred to the Pittsburgh, Pa., district sales office where he will serve as sales engineer for the American Manganese Steel and Electro-Alloys Divisions of the company. He is replacing M. A. Zeller who has resigned from the company. Mr. McCulloch, formerly located in Rochester, N. Y., has been with Brake Shoe since 1945 when he started with the company as an apprentice. During World War II he served as a first lieutenant with the U. S. Army in the European Theatre of Operations.

A GOOD SOURCE OF STEAM FOR PULP AND PAPER MILLS

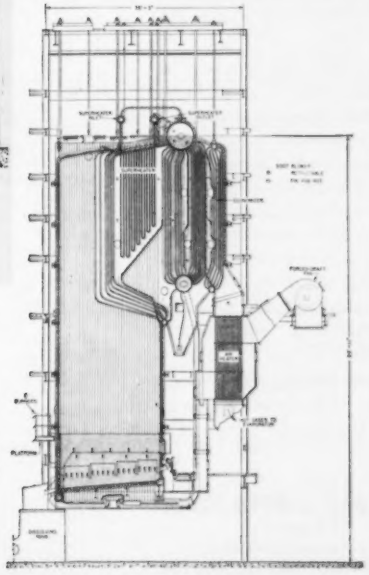


B&W Two-Drum Stirling Boiler, oil- and gas-fired. Also available in four-drum and integral-furnace types.



B&W Four-Drum Stirling Boiler with special bark furnace. Also available in two-drum types.

B&W Black Liquor Recovery Unit.



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THE BABCOCK & WILCOX CO.
General Offices: 85 Liberty St., New York 6, N. Y.
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P45

PROTECT or PAY

You have no other choice!

Corrosion costs industry over $6,000,000,000 annually. No business escapes its effects. Attacks by acids, alkalis, salts, gases and atmospheric conditions cause untold damage that often is overlooked until too late.

Check the danger points in your plant – piping, machinery, walls and all other exposed areas. Most conventional coatings fail when corrosion threatens. That's why Amercoat is designed to give *extra protection* against surface failure. Highly resistant to a wide variety of chemicals, brines, fumes, weathering, abrasion, it is available in a number of formulas, *each designed to meet specific conditions.*

Be sure your plant and equipment are safe from corrosion damage. Protect now with Amercoat.

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JOHNS-MANVILLE SALES CONFERENCE

The Lake Shore Club, Chicago, was the scene of a three-day sales conference recently held by the Celite Division of Johns-Manville Corp. Photograph shows those in attendance, who included all field representatives, as well as management, factory and research personnel. Among J-M executives present were: L. M. Cassidy, vice president for sales; A. S. Elsenbast, Vice President and General Manager of the Celite Division; W. D. VanArnam, sales manager, Celite Division, and Dr. A. B. Cummins, Celite research. Among the subjects discussed were sales plans for the coming year, with emphasis on new developments and facilities and broadened applications for the company's line of diatomaceous silica filter powders and mineral filters.

Oakite Products, Inc., manufacturers of specialized industrial cleaning materials, held a series of technical-sales meetings at the Hotel Commodore, New York City, December 15-17, for field service representatives from the Canadian, Detroit, New England, New York, and Philadelphia sales divisions. Highlighting these meetings were reports delivered by the company's research chemists and service engineers on latest trends in cleaning and related procedures designed to assist industry in combating rising production costs. Also reported upon were new materials to be made available by the company during the coming year. Similar regional conferences held at the Sheraton hotel, St. Louis, December 8-10, and the Biltmore hotel, Los Angeles, November 28-30, were attended by representatives from Oakite's Chicago, Cleveland, Midwestern, Milwaukee, St. Louis and Southern divisions, and its North Pacific, South Pacific and Southwestern sales territories respectively.

The Du Pont Co. on December 22 made a proposal increasing pension benefits to all employes. This would increase company pension payments at all levels, without cost to the employe. In addition, it would set a $100-a-month total minimum retirement income including primary Social Security benefits at age 65 for employes of 25 or more years' service. The proposal is a further modification of the Du Pont pension plan, which was first established in 1904. All Du Pont Co. employes, both wage roll and salary, are covered by the present pension plan. Eligibility for pension begins after 15 years with the company. An employe may elect to retire at age 60, if he has at least 30 years of service, and must retire at 65. Retirement on pension for reasons of permanent incapacity is allowable after 15 years. These provisions remain unchanged in the new proposal.

Lockport Felt Co. shared over $25,000 in Christmas bonus representing six percent of their 1949 wages among approximately 160 employes, it was announced at a Christmas party at Memorial hall by Raymond J. Lee, executive vice-president. Mr. Lee also disclosed that the company will absorb employe costs of the state disability and health benefits program, which becomes effective January 1, as well as employe costs of the Blue Cross hospitalization plan. The company, which manufactures paper mill felts and supplies, has had a pension plan for 40 years. Three years ago the concern installed an insurance group annuity system and a group life insurance plan. More than 300 persons attended the gathering which was the first of its kind held since 1946.

Koppers Co., Inc., made further gains in extending and diversifying its activities during 1949. Approximately $5,000,000 was expended during the year for capital additions and replacements, bringing the total expended for these purposes since World War II to more than $37,000,000. In this time, the company has entered into many new activities, has acquired new plants, and modernized older plants to attain more efficient operation.

Stein Hall Announces Changes

NEW YORK—Stein, Hall & Co., Inc., New York, announces the resignation of Joseph A. King as manager of the Providence branch office. Roswell D. Armstrong, who has been manager of Stein Hall's Boston office for a number of years, has been appointed New England manager in addition to his other duties. Jesse A. Fraser, long a member of the Providence office staff, has been appointed manager of the Providence office.

DIVISIONAL CAMPAIGN CHAIRMAN

Morris S. Rosenthal, president of Stein, Hall & Co., Inc., will serve as chairman of the exports and imports division of the 1950 New York Heart Campaign. Mr. Rosenthal's acceptance of the post was announced by William C. Langley, chairman of the commerce and industry committee of the New York Heart Campaign, which begins officially on February 14. Mrs. Arthur Baer is General Chairman of the drive to raise $750,000 in the fight against heart disease through a program of research service and education.

Paper Product Pointers
FROM CYANAMID

Paper-Makers!
Bring All Your Wet-Strength Paper Problems To Cyanamid

For satisfactory and profitable solutions to wet-strength paper problems, look to Cyanamid—pioneer in the field of wet-strength paper research and development. In addition to its technical service to manufacturers, Cyanamid offers three efficient resins for imparting wet strength to paper:

PAREZ* Resin 607
a melamine-formaldehyde resin

PAREZ Resin 609
a urea-formaldehyde resin (cationic)

PAREZ Resin 610
a urea-formaldehyde resin (anionic)

Each of these resins is adapted especially to assure economical and satisfactory results in the particular type of application for which it was developed. Together, they have greatly increased the uses and potential markets for paper.

If you have a wet-strength paper problem or are interested in finding out how wet strength can impart versatility and sales appeal to your products, call on Cyanamid. Complete technical information is available in booklet form. Our Technical Service Staff is always glad to help solve particular problems.

ALWAX** Sizes • WAXINE* Sizes • Rosin Size • PAREZ* Resins Synthetic Resins • Casein • Alum • Sulfonated Oils • Fillers Defoamers • Soda Ash • Caustic Soda • Salt Cake • Acids • Clays AEROSOL* Wetting Agents • CAL MICRO** (Calcium Carbonate) AZITE** Liquefier 900 and other Paper Chemicals.

*® **Trade-Mark

Sales Offices: Boston, Mass.; Philadelphia, Pa.; Pittsburgh, Pa.; Baltimore, Md.; Charlotte, N. C.; Cleveland, Ohio; Cincinnati, Ohio; Chicago, Ill.; Detroit, Mich.; Kalamazoo, Mich.; St. Louis, Mo.; Los Angeles, Calif.; San Francisco, Calif.; Seattle, Wash. In Canada: Dillons Chemical Co., Ltd., Montreal and Toronto.

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INDUSTRIAL CHEMICALS DIVISION
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DUPONT "QUILON"

NEW OUTSTANDING WATER-REPELLENT AND SIZE FOR PAPER

New Du Pont "QUILON" stearato chromic chloride opens new sales horizons for makers of paper products

Quickly and easily, using conventional mill equipment, paper makers can produce a wide variety of paper products with superior water-repellency and size characteristics.

Many Unusual Features

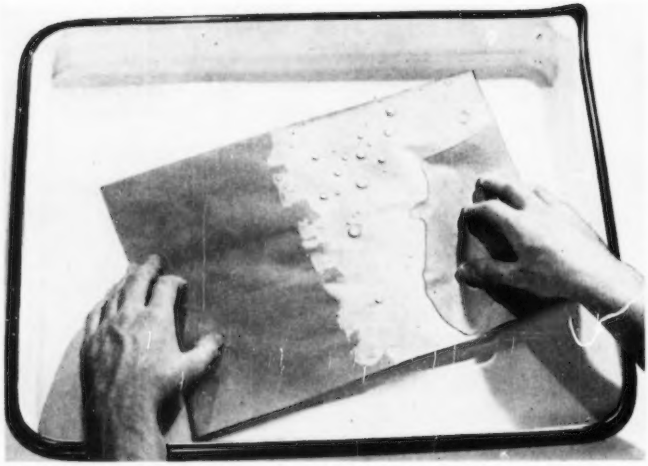
In actual production, paper treated with a dilute water solution of new Du Pont "Quilon," a chromium complex, resists absorption of water and repels water impinging on its surface. This treatment may be used alone or may supplement rosin-alum treatment where higher sizing is sought at low cost. In contact with water, paper treated with "Quilon" retains strength for longer periods of time, and thus possesses wider utility. Treatment with "Quilon" does not adversely affect the appearance, texture, strength or other physical properties of paper, does not produce a slippery or waxy "feel."

Six Profitable Uses

With new Du Pont "Quilon," paper makers can (1) Develop water repellency on all classes of paper alone or with many other coating or sizing materials; (2) Minimize undesirable water sensitivity of soluble coatings, including starch and starch-containing types; (3) Control penetration of water-soluble coatings during application; (4) Minimize adhesion of paper on freezing; (5) Improve the bonding of wax coatings; (6) Up-grade sizing on papers where increased rosin-alum is not applicable or effective.

Broad Possibilities

Treatment with "Quilon" enables paper makers to produce a whole new range of products and to improve many standard products for extra salability. Such treatment makes it easy to produce better ice bags and wet-strength bags, grocery bags, shipping sacks, butchers' wrap, paper tablecloths, twisted paper products, decorative crepe, glassine, wallpaper, signboard paper, drinking cups and dish stock, building papers, paperboard, jute liners, waxed paper, stripping papers, anti-sticking deep-freeze wrappers, and many other items.



Right half of paper—treated with new Du Pont "Quilon"—resists water absorption, repels water impinging on its surface, retains strength over longer periods. These characteristics are absent from the left-hand side of the paper, which has not been treated with "Quilon."

You May Obtain Data and Sample

Investigate this unusual new product. Learn how it may help you build sales, cut costs! Write for data on this remarkable product covering use applications, methods of treatment, properties of treated papers. Du Pont Technical Service will gladly advise you on specific applications of "Quilon."

New Technical Bulletin Now Available Write for it!

E. I. Du Pont de Nemours & Co. (Inc.)
Grasselli Chemicals Dept.
Wilmington 98, Delaware

Du Pont "QUILON"

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REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING
. . . THROUGH CHEMISTRY

The Fundamentals of Adhesion

G. M. KLINE
Chief, Organic Plastics Section

F. W. REINHART
Assistant Chief, Organic Plastics Section

National Bureau of Standards, U. S. Department of Commerce, Washington, D. C.

The most significant factor in adhesion is the molecular attraction operative between the adherend and the adhesive. There are many physical factors which affect the strength of a bond by determining the closeness of contact of the adherend and adhesive, by altering the surface area involved, or by influencing the stress conditions in the joint either as initially formed or under external loading. Although some of the strength of a bond between an adhesive and a porous surface can be attributed to tendrils of adhesive which enter the pores, this mechanical interpenetration can not account for more than a small fraction of the joint strength. Evidence has accumulated from many pertinent fields which indicates that molecular attractive forces are primarily responsible for the bond between any two surfaces.

The types of chemical bonds involved in specific adhesion will be reviewed first in this paper, followed by a discussion of various physical factors which affect bond strengths.

Chemical Factors in Adhesion

In considering the chemical and physical phenomena involved in adhesion and cohesion, four general types of chemical bonds must be recognized: electrostatic, covalent, and metallic, which are referred to as primary valence bonds, and residual bonding attraction forces, commonly known as van der Waals forces, which are referred to as secondary valence bonds.

Primary Bonds

Electrostatic bonds. Electrostatic or polar bonds are the type which act to hold together the atoms in common salts. An element immediately preceding a rare gas in the periodic table is strongly electronegative, whereas one immediately following it is strongly electropositive. There is a tendency on the part of the reactive elements to change their configurations to conform with those of the rare gases, which are remarkably inert. Thus, an atom of potassium combines with one of chlorine by means of an electron transfer which results in the configuration of argon for each *(Figure 1)*.

By means of this mutual claim on the transferred electron the two ions will remain closely associated with one another as potassium chloride. This association can be interfered with, however, as by solution in water, in which case the potassium chloride will dissociate into chlorine as a negative ion and potassium as a positive ion. If the water is removed by evaporation, these ions will align themselves to form a crystal lattice. In such a solid the attractive forces between the oppositely charged ions, except those on the surface, will be satisfied. However, in an amorphous solid some of the attractive polar forces will not be satisfied because of the random distribution of the ions.

Co-valent bonds. These are the type which act to hold together the atoms of carbon, hydrogen, and other elements in organic compounds. It is also this type of bond which holds the atoms together in diatomic gases, such as chlorine. A co-valent bond is one formed by two atoms sharing electrons in such a way as to account for the stability of each in attaining the rare gas configuration. Thus, in the chlorine molecule each atom requires an electron to complete its outer shell *(Figure 2)*. In this molecule the positive attraction of the nucleus of each atom is equally great on each of the two negative charges of the shared pair. Substances formed by such bonds do not ionize in solution. In the case of carbon, it has an outer shell of four electrons which it will share in covalent bonds with other atoms to obtain a stable outer shell structure of eight electrons. In stable gas methane it shares an electron with each of four hydrogen atoms *(Figure 3)*. In the crystalline form of carbon (diamond) it shares an electron with each of four other carbon atoms.

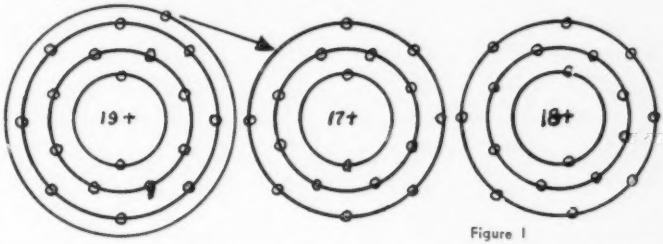

Figure 1

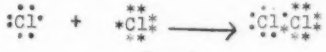
Figure 2

Figure 3

There is a special type of co-valent bond which involves sharing of electrons by an atom in a normally stable compound with other atoms. For example, the sulfur atom in dimethyl sulfide has formed two normal covalent bonds with two carbon atoms to bring about the completion of its full complement of eight electrons in its outer shell *(Figure 4)*. However,

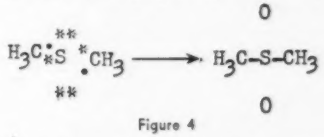
Figure 4

this compound can take on two oxygen atoms to form dimethyl sulfone; in this compound the sulfur atom is sharing four of its electrons with two oxygen atoms in addition to sharing its other two electrons in normal covalent bonds with carbon. Such bonds formed in normally saturated compounds are called coordinate covalent bonds.

This same mechanism is used to explain another phenomenon occurring in organic molecules; namely, the chelate compounds. The peculiar properties of the hydrate of the sodium derivative of benzoyl acetone indicate that this substance may be represented by the formula in *Figure 5* in which the

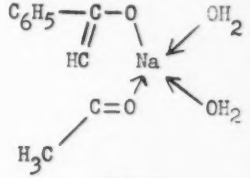
Figure 5

arrow indicates that two electrons are contributed by each such oxygen atom. It will be noted that in effect seven electrons are being shared with the sodium atom to give it an outer shell structure of eight electrons. If the two molecules of water were present as water of crystallization, the compound should have the same chemical properties as the anhydrous salt. The anhydrous salt is insoluble in toluene,

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whereas the hydrate is soluble, indicating that a different compound has been formed by coordinate co-valent bonding with the water molecules.

Similarly, evidence indicates that the phenolic hydrogen in salicylaldehyde is itself linked to the oxygen of the aldehyde group by a coordinate co-valent bond *(Figure 6)*. This leads to

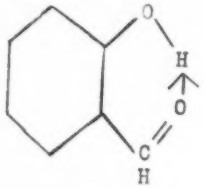


Figure 6

a very important case of this type of bonding — namely, the formation of hydrogen bridges between molecules. Many substances containing hydroxyl groups exhibit this structure and even water has been shown to have a trimeric structure in ice. Thus, coordinate co-valent bonding may be an important factor in adhesion between substances containing hydroxyl or related groups.

Metallic bonds. As the name indicates, these are the type which hold the atoms of metals together. A pure metal consists of a crystalline arrangement of metallic cations with free electrons moving in the interstices in a continuous set of energy levels. Thus, a metal structure is relatively homogeneous and nonpolar. However, because of its freely flowing electrons a metal has mirror image forces induced at its surfaces which are equal and opposite to the polar forces of an adhesive used on it. Therefore, insofar as polar properties are concerned, an adhesive would have as great an affinity for a metal as it would have for a material of polarity comparable to its own.

Secondary Bonds

Van der Waals forces are responsible for the so-called secondary bonds between substances as contrasted with the primary bonds—electrostatic, covalent, and metallic—which are based on the potent forces of attraction between atomic nuclei and orbital electrons. When such primary bonds are formed, the positive and negative charges of the participating atoms are not completely neutralized. There remain in many molecules residual energies which are very nearly of stable bond forming magnitudes. Van der Waals provided equations for calculating the magnitudes of these residual attractive forces for all substances. These forces are greater for the molecules of compounds than for molecules of elements or inert atoms, thus indicating that unequal distribution of charges accounts for the larger residual force field. The more asymmetric the molecule, the greater the Van der Waals forces will be. These secondary bonding forces are of considerable significance in the adhesive behavior of complex substances.

Van der Waals forces can be attributed to three different effects: (1) the orientation effect of permanent electric dipoles; (2) the induction effect of permanent dipoles on polarizable molecules; and (3) the dispersion effect of internal electron motions independent of dipole moments. These effects can be better understood by considering the geometry of molecules and their behavior in an electric field.

Orientation forces. Molecules in which the centers of mass of the positive and negative charges are not coincident because of asymmetric internal structure possess an electric moment, i.e., they have an electric dipole. In the organic field, molecules containing oxygen, nitrogen, sulfur, and halogen atoms possess permanent electric dipoles. Such molecules tend to orient themselves in a uniform electric field, attempting to align themselves with the dipole axis parallel to the direction of the field. Even without an applied electric field, dipole molecules can exert an orienting influence on similar molecules by attraction between the unlike poles of each.

Induction forces. Molecules which do not possess a permanent dipole moment, with the exception of the inert gases, may be polarized by placing them in a uniform electric field. Since these two poles are produced only by the external field, the molecules are said to possess induced dipole moments. The permanent dipole of another molecule can serve to induce the field. The dipole molecules are, of course, also polarized additionally by the external electric fields. These induced forces are small compared with the orientation and dispersion forces involved in secondary bonds.

Dispersion forces. Forces of attraction exist even between atoms of the inert gases in which there is spherical symmetry of the charge shells and hence no orientation or induction effects. These pure dispersion forces are attributable to the interactions always occurring between electron systems because of constantly shifting electron positions. They are present in all molecules as residual valence forces. These dispersion forces are never as powerful as the orientation forces.

De Bruyne *(1)* has pointed out that the orientation and dispersion forces correspond, respectively, to those operative in the hydrophilic or polar liquids such as water, and the hydrophobic or nonpolar liquids, such as benzene. The fact that these two liquids do not mix is attributable to the strength of the orientation forces between the permanent dipoles of the water molecules, squeezing out the adjacent benzene molecules. Similar considerations may be expected to apply to the interaction between an adhesive and an adherend. In general, strong joints to polar adherends are not obtained with nonpolar adhesives, and vice versa. Thus, wood calls for hydrophilic or polar adhesives while rubber requires hydrophobic or nonpolar adhesives. Furthermore, nonpolar adhesives, which must rely mainly on dispersion forces, should not be expected to produce bonds as strong as those of polar adhesives which can possess orientation attractions many times greater than can be produced by dispersion forces. De Bruyne cites this as a possible explanation for the fact that the most effective method of rubber bonding appears to depend upon producing primary bonds, e.g., by the reaction of sulfur with both the rubber molecule and the adherend.

Chemical Nature of Surfaces

A knowledge of the chemical nature of surfaces is necessary in order to understand the mechanism of bond formation between adhesives and adherends.

The surfaces of solids are entirely different from their internal structures. The simple treatments of grinding and polishing differ very greatly in their effects on surface nature. In metals, especially, X-ray diffraction patterns show that grinding removes sections of the surface without appreciable distortion of the remaining crystal structure, whereas polishing removes the promontories and deposits materials from them in the crevasses, leaving a smooth transparent amorphous film known as the Beilby layer. This layer has more of the characteristics of a liquid than a solid and is much more reactive. If, for example, a metal vapor is condensed upon a polished metal surface, a crystal pattern is first obtained, but on standing this changes to that of a completely amorphous structure. If a nail is hammered into a crystalline surface, the amorphous ring around the hole will be more readily attacked by acids than the remainder of the surface. Glass surfaces when polished are rendered doubly refracting to a depth of 3000 Å.

Solid surfaces are very irregular in their constitution. Thus, the surface of even a monocrystalline metal will contain different faces, edges, corners, and projections. For this reason all parts of a given surface will not have the same catalyzing ability and consequently the same degree of affinity for adhesive substances. Experiments show that different faces of the same crystal exert very different forms of attraction upon dyes. Thus if lead nitrate is immersed in a solution containing methylene blue and picric acid, some of the surfaces will be blue and some yellow; neither film is contaminated with traces of the other dye.

The greater the activity a surface possesses, the more likely it is to be contaminated with impurities which are present in the air. Freshly split mica surfaces will seize each other tenaciously, but if they are freely exposed to circulating air currents they lose this activity after a few minutes.

It has been demonstrated that if these surfaces are covered, they will retain their attraction for each other for several days. Accidental traces of grease will greatly reduce the wetting properties of such surfaces and even slight contamination will increase the contact angle with a liquid.

It has long been known that the affinity of the surface of a solid substance for a liquid is directly related to the shape of a drop of the liquid on a smooth surface of the solid. No liquid is known to make an angle of contact of 180° with a solid; this means that there is always some force of attraction between a liquid and a solid. When the liquid wets the solid, the angle of contact is small or zero. The best adhesion is given by adhesives which wet the surfaces of the adherends, in other words, adhesives which have a greater adhesive attraction for the adherend surfaces than cohesive attraction within themselves. The forces governing the wetting of surfaces are the Van der Waals chemical attractions (orientation, induction, and dispersion) previously discussed.

Physical Factors in Adhesion

As mentioned in the introduction, the physical factors which affect the strength of bond between an adhesive and adherend involve (1) closeness of contact, (2) surface area, and (3) stress conditions.

Surface Contact

The physical character of the surface of the adherend and the physical state of the adhesive must be such that the molecules of the two materials can be brought into close enough contact for the molecular forces to become operative.

Adherend Surface. The surface of the adherend must be clean and sound. It is well recognized that a clean surface is necessary to obtain adhesive bonds of maximum strength. This is definite recognition that adhesion is specific. Most workers in adhesives try to remove all the loose dirt and grease but certain types of strongly bonded foreign material, such as absorbed liquids and gases, are very difficult to detect and to remove. These foreign materials on an adherend often are decisive factors in determining whether or not a particular adhesive will bond to a particular adherend.

A sound surface is one which is free of poorly bonded foreign matter but is not necessarily of the same composition as the bulk of the adherend. An anodized skin on aluminum is an example of a sound surface layer differing in composition from the rest of the adherend. However, in dealing with systems of this type, difficulties in interpretation will be encountered if it is assumed that the molecules of the adherend are bonded directly to the molecules of the adhesive. There is no doubt that the presence of a sound foreign surface on an adherend which was thought to be pure has obscured the actual seat of adhesion in some investigations.

Adhesive surface. The physical state of the adhesive must be such that the molecules can come into close contact with the surface of the adherend so that the molecular forces can become operative. This molecular nearness can be obtained in several ways. (1) The adhesive molecules can be synthesized in contact with the adherend, as in the case of monomers which polymerize or condense to form a solid adhesive in situ. (2) A solid material can be applied as a solution in a volatile solvent. (3) A solid adhesive can be liquefied by heating. (4) A solid material can be liquefied by applied pressure is removed.
sure, becoming solid again when the

Surface Area

There are several methods commonly employed to increase the area of solid surface available for participating in the bonding operation. These include physical means, such as sandblasting and sandpapering, and chemical means, such as acid-etching and solvent attack. The process of anodizing in addition to changing the composition of the surface of the metal also serves to achieve a marked increase in surface area. It is known that such methods may yield surface areas as much as 25 times the original areas.

In order to obtain a strong joint, a smooth surface is more desirable than a roughened one, inasmuch as the depressions in the latter must be filled in addition to the gap between the two surfaces. Furthermore, if the surface is deeply scored, there is always a possibility that air bubbles will be trapped in the glue line. The existence of such points of interfacial discontinuity will cause high concentrations of stresses in their vicinity which will result in premature failure of the entire bond when external loads are applied. Thus, sanding of wood surfaces with the finest grade of sandpaper immediately before gluing gives a much better bond than that obtained with glazed surfaces produced by planing or with roughly sanded ones. The effect of the sanding operation is a combination of cleansing and increase of surface area.

Stress Conditions

Although molecular attraction is the most significant factor in adhesion, the stress-strain behavior of an adhesively bonded joint is probably the most important factor in determining its strength under service or testing conditions. Readily deformable adhesive materials such as rubber flow or yield sufficiently at ordinary temperatures to avoid production of large residual stresses during the bonding operation. However, this type of adhesive does not produce the rigidity required for structural applications and fails at low temperatures for the same reasons that rigid adhesives fail at ordinary temperatures — namely, inability to eliminate stress concentrations by yielding with the dimensional changes of the materials bonded.

Analysis of the factors responsible for the production of stress concentrations in a rigid bond must include the following:

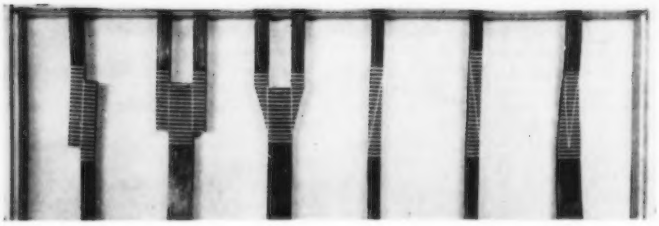
1. Stress-strain characteristics of adherend.
2. Stress-strain characteristics of adhesive.
3. Dimensional changes in setting of adhesive.
4. Dimensional changes under service conditions.

Stress-strain characteristics of adherend. The cohesive strength and the modulus of elasticity of the material to be bonded determine to a large extent the magnitude of the stresses which may develop in an adhesively bonded joint. Thus, in bonding operations involving materials of low cohesive strength such as felts and cardboard, failure of the adherend occurs before large stresses are set up in the adhesive or at the adherend-adhesive interface. Likewise in bonding operations involving readily deformable materials such as plastic films, the adherend tends to flow or creep to relieve stresses in the joint. However, in many industrial applications of adhesives, the materials to be bonded have both cohesive strengths and moduli of elasticity which are higher than those of the common adhesives.

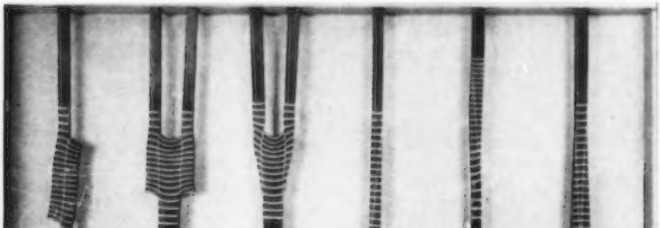
As the thickness of the material to be bonded approaches zero, the stresses set up due to its modulus characteristics also approach zero. Accordingly, it has been found possible to bond thin metal foils to other materials, whereas the same adherends in heavier gages would be incompatible. This stress-reducing factor is also utilized in the production of mechanical mixtures of materials in powdered form or in the form of fine filaments.

Stress-strain characteristics of adhesive. The same considerations regarding cohesive strength and modulus of elasticity which are outlined above for the adherend apply in the case of the adhesive. Joint strength has been observed to be inversely proportional to the thickness of the glue line. This may be attributed to the fact that in bonding two pieces of the same material, the stresses set up in the bond as a result of restrained dimensional changes in the adhesive would be proportional to the thickness of the bond. The greater probability of flaws occurring in a thicker glue line has also been cited as a significant factor in this thickness-strength relationship. However, starved joints resulting from application of too little adhesive, particularly in the case of adherends with porous surfaces, lead to adhesive film discontinuities and hence to stress concentrations.

Plastic or highly elastic adhesives will react to an external load to produce approximately uniform stress conditions in a bonded joint. However,



A. Specimens under no load.



B. Specimens under load.

Figure 7.—Distribution of stresses in shear test specimens. (From Jackson, reference 3).

with rigid types of adhesives stress concentrations develop whose magnitude depends upon the geometry of the joint and the mechanical properties of the adhesive and adherend. This variation in the behavior of bonded joints can be visualized by inspection of *Figure 7* which shows the distribution of stresses in shear test specimens. The concentration of stresses at the ends of the joint for lap-joint specimens and for the single scarf lap specimen prepared with materials of unequal modulus is readily apparent. If the two adherends are of equal modulus, the single scarf joint is adequate to produce generally uniform stress conditions. For materials of unequal modulus, however, it is necessary to use a double scarf joint in which the angle taper of each adherend is proportional to its modulus. These examples of stress concentrations in joints illustrate what happens at the bond in the case of adhesives and adherends of different stress-strain characteristics.

Dimensional changes in setting of adhesives. In order to bring into play the molecular forces involved in adhesion, adhesives are generally in a liquid or plastic state at some stage during the bonding operation. To convert the adhesive to a fixed or hardened state, chemical or physical change is necessary, such as condensation, polymerization, oxidation, vulcanization, gelatin, hydration, evaporation of volatile constituents, or cooling below the transition point. The decrease in volume which accompanies these chemical reactions, solvent losses, or temperature changes leaves residual strains in the joints. In order to keep these to a minimum, it is desirable that most of the contraction of the adhesive takes place while it is still in a plastic state. The bond may sometimes be maintained if the materials bonded are thin enough to permit the relief of stresses by bending or warping, either of which is undesirable.

When two materials are bonded together at high pressures, strains are produced at the bond when the pressure is released. This strain is proportional to the ratio of the moduli of elasticity of the two components. The lowest pressure feasible should be used to produce bonds with the lowest internal strains.

The bonding strength exhibited by a particular adhesive is the additonal load which, added to the internal residual stresses, is sufficient to disrupt the bond. In some cases this additional load is zero and the materials are said not to bond.

Dimensional changes under service conditions. There are four major factors which lead to dimensional changes in service and hence to the development of internal stresses in adhesive joints: namely, temperature variations, humidity variation, loss of volatile or soluble components, and chemical reaction.

Inorganic materials such as glass and metals are characterized by relatively low coefficients of thermal expansion, whereas organic materials in general have high thermal expansion coefficients. Hence stresses are developed in joints prepared with these two types of materials when the temperature differs appreciably from that at which the bond was formed. If the molecular cohesion of one of the materials is sufficiently low, the stresses developed at the glue line can be relieved by flow. However, such materials usually undergo excessive flow at temperatures above the softening point and have poor bond strengths. For materials which have high molecular cohesion and hence undergo very little flow, such as the thermosetting resins or most materials at low temperatures, the stresses developed because of different thermal expansion coefficients are not readily relieved by molecular flow.

Large changes in moisture content of adhesives and adherends may occur because of relative humidity variations normally encountered, ranging from the dry heated atmospheres (about 10 percent relative humidity) indoors in winter to the damp condensation conditions which may persist for long periods at other times during the year. The problem of internal stresses attributable to dimensional changes of materials sensitive to relative humidity can be reduced, if not eliminated, by application of a surface material impervious to moisture. Moisture-sensitive materials should be bonded in such manner that they contain at the end of the bonding operation the normal amount of water present under average conditions.

Loss of volatile components, such as plasticizers, or water and solvent soluble materials, leads to shrinkage of the adhesive or adherend and the introduction of internal stresses. Likewise, further curing of thermosetting resins is a frequent source of shrinkage which leads to failure of adhesive bonds in service.

All of these various causes of stress

concentrations in joints between adhesives and adherends must be considered in the design of adhesively bonded structures and the selection of materials for specific jobs.

Other Factors in Adhesion

Molecular weight. The highest bond strengths are usually observed with polymers of intermediate molecular weights. The low molecular weight materials fail in cohesion rather than adhesion. The high molecular weight materials have low bond strengths because 1) the adhesive does not flow sufficiently to make good contact with the adherend or 2) if drastic bonding conditions are used to make the adhesive flow to make contact, the adhesive becomes too rigid to relieve stresses developed on returning to room conditions, thus lowering the bond strength.

McLaren and Seiler *(2)* showed that provided the molecular weight is high enough so that cohesive failures do not occur the adhesion is independent of the molecular weight. However, it seems reasonable to expect that in a case where adhesion depends on end groups, an increase in molecular weight would result in a decrease in adhesion.

Molecular weight distribution. A low molecular weight fraction in a polymer tends to act as a plasticizer. The flow characteristics are increased, making the relief of stresses more likely. This effect, however, can be carried too far and result in a polymeric adhesive with low cohesive strength.

Plasticizers. The addition of plasticizers to a polymeric material results usually in a decrease in cohesive strength and an increase in flow characteristics. By choosing the proper amount and kind of plasticizer, it is often possible to convert too rigid a polymer with many other desirable characteristics into a good adhesive. The addition of a plasticizer of a different chemical type may affect the molecular forces responsible for the adhesion. By addition of the proper plasticizer, it is often possible to increase or decrease the adhesion of a specific adhesive-adherend system.

Tack temperature. The tack temperature is related to the flow characteristics and to the molecular weight of the polymer in question. The tack temperature is indicative of the region in which the material flows more or less readily. It is apparent that a material with a low tack temperature will have low cohesive strength and one with a high tack temperature will not have the requisite flow characteristics. Hence, an apparent relation between tack temperature and adhesion would be expected.

Absorbed materials. An adhesive will sometimes bond to only certain random areas of an apparently clean adherend or good bonds will be obtained with one lot of adherend and not with another similar lot. These inconsistent results can often be explained by the presence of absorbed gases, water, oil, or other materials on the surface of the adherend which are difficult to remove and are not visible to the eye. Special cleaning, storing, and handling techniques are often needed to obtain reproducible results.

Porosity. The porosity of a surface can affect the adhesive in many ways. If the liquid adhesive flows into the pores and solidifies so that the surfaces of the projections maintain contact with surfaces of the pores, an increase in adhesion will be observed because of the increased area of contact over that presented by smooth surfaces. If the projections are tight in the pores, an increased strength may be observed in shear tests because of the mechanical effect. Mechanical effects of this type are not common. The major part of any increased strength is attributed to the increase in area of contact.

The presence of pores may also cause the bond strength to decrease. First, a porous surface is harder to clean. Second, porous surfaces are often not sound; the material has a low cohesive strength and failure in cohesion rather than adhesion is encountered. Third, it is more difficult for the adhesive to wet the surface, particularly if it is not sufficiently fluid in the application stage. Fourth, gases may be trapped in the pores hindering contact between adhesive and adherend at these places.

Prime coats. It is sometimes desired to bond materials together for which no suitable common adhesive is available and which do not bond to each other. A prime coat is often applied on one or both of the materials in such cases. The primer in this instance is an intermediate adhesive between the adherent and the adhesive proper. The principles which apply to adhesion apply also to these prime coats or primers.

Summary and Conclusions

Bonded joints may often be designed in accordance with the fundamentals discussed herein so that stronger bonded assemblies are obtained. Particular attention needs to be given to the design of test specimens and procedures for evaluating adhesion and to interpretation of test data in terms of the chemical and physical factors involved in adhesion. Recent contributions to our knowledge of adhesives and adhesion are listed in the appended bibliography.

Acknowledgment

A research project has been undertaken at the National Bureau of Standards under the sponsorship of the Office of Naval Research on the nature of adhesion and the mechanism of adhesive action. This review of the fundamentals of adhesion has been prepared in connection with the planning and interpretation of the experimental portion of this investigation.

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Knotter Consistency Control Increases Screening Capacity

The sulphite mill of the Flambeau Paper Division, Kansas City Star Company, Park Falls, Wisconsin, has found an efficient answer to higher production and lower costs. The mill has increased screen room production 20% and eliminated the cost of one man's services by installing an Askania Thin Stock Consistency Control System and two knotter screens.

The Askania Control System consists of three major units: (1) Detector Box (Sensing Unit); (2) Jet Pipe Operated Regulator (Regulating Unit); and (3) Double Gate Valve and Mixing Box (Control Unit).

The operation, briefly, is as follows:

When stock and water enter the mixing chamber in proper proportions for desired consistency, the Jet Pipe Regulator, control cylinder and double gate valve are motionless. The head of the stock on bubbler tube in detector box is such that the pressure impulse being sent to the regulator is equal to the force of the spring pressure set by handwheel on regulator.

When consistency of stock increases, a heavier mat is formed on the rotating screen of detector box, decreasing drainage rate through screen and increasing head on bubbler tube. This impulse pressure increase is immediately transmitted to regulator. The Jet Pipe moves in proper direction causing the control cylinder to move double gate valve which closes stock side and opens water side.

When the stock of decreased consistency reaches detector box the head on bubbler tube drops until impulse pressure again balances opposing spring pressure. The Jet Pipe moves back to mid-position, stopping movement of control cylinder and holding double gate valve in new position.

This action takes place continuously, maintaining the consistency to the knotter screens within a few hundredths of one per cent.

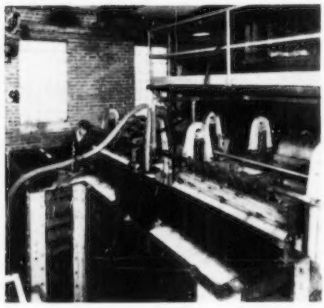


Figure 2. Jonsson knotters improve efficiency of screening system.

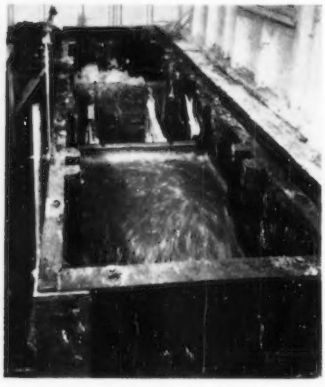
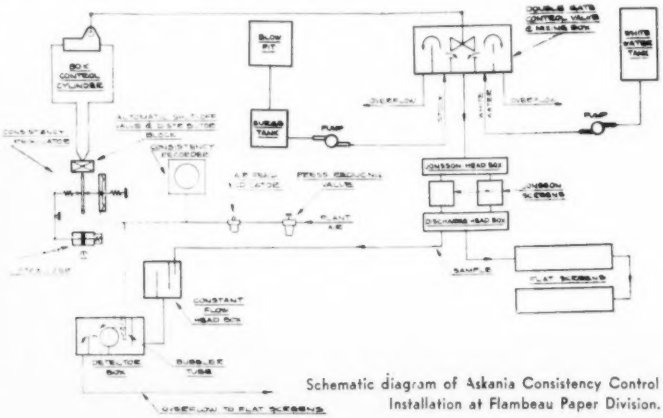


Figure 1. Askania control valves for stock and water are automatically adjusted.



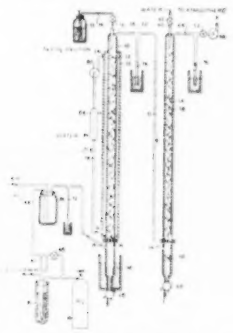
Schematic diagram of Askania Consistency Control Installation at Flambeau Paper Division.

Patent Abstracts

● ***In addition to abstracts on the technology of pulp, paper and related industries, miscellaneous abstracts which may provide useful information are included.***

2,481,240 — Method for Producing Chlorine Dioxide. William Howard Rapson and Morris Wayman, Hawkesbury, Ontario, Canada, assignors to Canadian International Paper Company, Montreal, Quebec, Canada. Filed January 11, 1946—Issued Sept. 6, 1949.

A continuous process for the production of gaseous chlorine dioxide by the reaction between



gaseous sulphur dioxide and an aqueous solution of sodium chlorate, consisting in the steps of supplying a continuous stream of an aqueous solution of sodium chlorate to a packed reaction column at such a rate as to distribute said aqueous chlorate solution over the surfaces of the packing in said reaction column, countercurrently supplying a continuous stream of gaseous sulphur dioxide and an inert diluent gas to said reaction column to bring said sulphur dioxide into contact with the surface of the aqueous chlorate solution distributed over the packing in said column, employing a heat exchanging medium to cool said packed column in the zone of greatest reaction, continuously moving said heat exchanging medium along said packed column from the zone of greatest reaction to the zone of efflux of spent liquor whereby to transfer heat from said first zone to said second zone, and continuously withdrawing from said reaction column a gaseous mixture containing chlorine dioxide and said inert diluent gas.

2,481,344 — Fluorescent Zinc Oxide Pigments. Lawrence J. Reimert and Erastus A. Fatzinger, Palmerton, Pa., assignors to The New Jersey Zinc Company, New York, N. Y. Filed June 13, 1947—Issued Sept. 6, 1949.

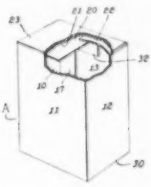
A fluorescent pigment comprising the product of calcining in a reducing atmosphere at a temperature within the range of about 850° to 1000° C. a mixture consisting of (1) a base material composed of zinc oxide and magnesium oxide, the magnesium oxide comprising from about 3% to about 50% by weight of the zinc oxide-magnesium oxide mixture, and (2) from about 0.25% to about 5% lithium sulfate by weight of the base material.

2,481,408 — Regeneration of Caustic Soda-Sodium Sulfide Cooking Liquor. Robert R. Fuller, Tuscaloosa, Ala., and Vernon Woodside, Niagara Falls, N. Y., assignors to Mathieson Chemical Corporation. Filed August 13, 1946—Issued Sept. 6, 1949.

In the preparation of aqueous solutions of caustic soda and sodium sulfide for use in the manufacture of paper pulp by the "kraft" process, in which the make-up sulfur and sodium are added to the "green liquor" as elemental sulfur and sodium carbonate, respectively, and the "green liquor" then causticized, the improvement which comprises adding the sulfur and sodium carbonate in intimate admixture with one another in amounts to regenerate the looking liquor.

2,481,405 — Carton. Robert M. Dunning, St. Paul, Minn., assignor to Waldorf Paper Products Company, St. Paul, Minn. Filed June 2, 1945 — Issued Sept. 6, 1949.

A carton comprising tubularly arranged side walls, end closure flaps issuing from said side



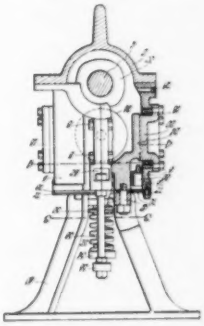
walls, a glue flap on one of the side walls adhered to the inner surface of an adjacent side wall, a diagonally cut end on said glue flap, and flap means on the closure flap of said one side wall having an edge engageable against the diagonally cut end of said glue flap the diagonally cut flap end and said engageable edge of said flap means being at right angles when the said one side wall and its closure flap are in the same plane.

2,481,687 — Hot Melt Coating Composition. Martin Salo and Harold F. Vivian, Rochester, N. Y., assignors to Eastman Kodak Company, Rochester, N. Y. Filed March 30, 1946 — Issued Sept. 13, 1949.

A composition of matter adapted for use in melt-coating operations having a viscosity of less than 100,000 cps. at 170° C. essentially consisting of 10-80% of a heat stable lower alkanoate ester of cellulose having a butyryl content of at least 45%, not more than two hydroxyls per 24 cellulose carbon atoms, and an acetone viscosity of 5-200 centipoises, 0-40% of a heat resistant organic acid ester of an aliphatic alcohol, which ester contains only C, H, and O and has a molecular carbon content of 18-24 carbon atoms and a molecular weight of 306-392 and 10-80% of a chlorinated diphenyl having a chlorine content of more than 40%.

2,481,999—Mechanism for Vibrating Diaphragms of Pulp Screens. Millard F. Hayes, Hudson Falls, N. Y., assignor to The Sandy Hill Iron & Brass Works, Hudson Falls, N. Y. Filed April 7, 1945—Issued Sept. 13, 1949.

The combination of a bridgetree provided with bearings having a shaft rotatable therein carrying a cam and having a well between said bearings in which said cam is located and which is open at its upper side with mechanism for vertically vibrating the diaphragm of a pulp screen comprising, half-housings extending upwardly from said bridgetree having contiguous inner side faces secured together in sealed relation, said half-housings formed to provide a vertical chamber over and in communication with said well and having side-walls provided with openings therethrough, guide members secured to said

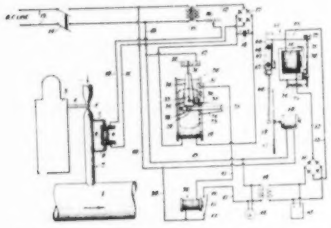


half-housings having parts extending through said openings and into said chamber and provided with spaced vertically extending inner faces disposed in said chamber, a crosshead in said chamber provided with a spring socket in its upper side, opposite outer side faces of said crosshead and said inner faces of the guide members provided with coacting guide means to permit vertical reciprocation of the crosshead in the chamber and prevent relative twisting movements thereof, a roller journalled in the lower portion of said crosshead in engagement with said cam, a flexible sealing member at the upper side of said half-housing and crosshead having an opening over said spring socket secured thereto and closing the upper end of said chamber, means securing said sealing member to said crosshead, spring means acting in the upper side of said crosshead disposed outside said chamber above the sealing member resisting upward movements of the crosshead, and a member over said sealing member secured to the upper side of said crosshead adapted for connecting to a diaphragm of a screen thereabove, each inner face of the guide member and of the crosshead including a pair of longitudinally extending flat surfaces arranged in the form of a V, and said vertical chamber and well providing a compartment for lubricant in which said cam, roller and crosshead are disposed and closed by said sealing member.

2,482,078 — Chlorine Concentration Limit Indicator for Chlorinating Systems. Charles F. Wallace, Westfield, N. J., assignor to Wallace & Tiernan Products, Inc., Belleville, N. J. Filed July 13, 1946—Issued Sept. 13, 1949.

In a system for continuously introducing a small concentration of chlorine into a relatively large flowing stream of aqueous liquid, said concentration being insufficient to affect the electrical conductivity of the liquid in a manner representative of the magnitude of said concentration, the combination, with conduit structure for establishing and discharging into said relatively large stream a minor flow of water quantitatively equalling a small fraction of said large stream, and with means introducing chlorine into the minor flow in a large concentration sufficient to provide the desired small concentration in the large stream, of a low limit indication system comprising a conductivity cell including electrode means exposed to the minor flow of water after introduction of chlorine thereto, a circuit supplying electric current through said cell, for variation of the amount of said current in response

to change of conductivity of the chlorine-containing water flowing therethrough, and means connected to said circuit and responsive to current flow therein and including an indicating



device, operated in response to a decrease of said current representative of decrease of chlorine supply below a predetermined low limit, for giving an indication of the existence and duration of the decreased chlorine supply.

2,482,086 — Resinous Compositions and Use Thereof in Forming Electrical Members and Laminated Products. Newton C. Foster, McKeesport, Pa., assignor to Westinghouse Electric Corporation, East Pittsburgh, Pa. Filed April 1, 1944 — Issued Sept. 20, 1949.

A laminated member comprising a plurality of sheets of fibrous material and a binder impregnating the sheets and bonding them together, the binder composed of the copolymer of 10 to 95 parts by weight of a monomer having the group $H_2C{=}C<$ and 90 to 5 parts by weight of the reaction product of at least one mol of an acidic compound selected from the group consisting of ethylene alpha-beta dicarboxylic acids and anhydrides thereof and one mol of a mixture of castor oil and another vegetable oil, the mols of acidic compound not substantially exceeding the mols of the acyl radicals in the esters.

2,482,142 — Structural Material of Compressed Resin Impregnated Paper Sheets. Gardner H. Chidester, Parker K. Baird, George E. Mackin, Forrest A. Simmonds, Clarence O. Seborg, Mark W. Bray, and John N. McGovern, Madison, Wis.; dedicated to the free use of the People in the territory of the United States. Filed October 2, 1943—Issued Sept. 20, 1949.

A structural material comprising compressed synthetic resin-bonded laminated sheets of paper; each sheet being made from pulp having a freeness of 750 to 860 cc.; each sheet of paper having a porosity index of about 3.2 to 75 seconds, an anisotropy of grain providing a ratio of at least 2.0 to 1 in tensile strength, and a density of 0.60 to 0.80 gram per cc., and a thickness of not more than about 4 mils; said sheets having a distribution of a solid, setrengthening synthetic resin in their porous structure which bonds them together; said structural material having a tensile strength of at least 25,000 lbs. per square inch and a modulus of elasticity in tension of over 2,000,000 pounds per square inch and having a density of not less than about 1.33.

2,482,118 — Paper Cutter. Robert J. Matthews, Hasbrouck Heights, N. J. Filed October 10, 1944 — Issued Sept. 20, 1949.

In a machine for cutting a blank, a rotatably driven roller having a plurality of annular cutting edges, a second rotatably driven roller having a plurality of cutting edges adapted to cooperate with the cutting edges of the first roller to perform a cutting operation, a table adjacent said rollers, means on said table for feeding a blank between said rollers, a shaft beneath said table, means for rotating said shaft, a cam on said shaft mounted for rotation therewith, means operated by said cam for intermittently preventing said feeding means from feeding a blank on said

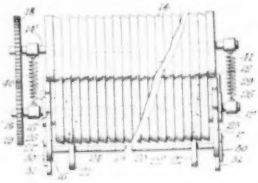


table between said rollers, another cam independently rotatable on the end of one of said rolers and in contact with the other of said rollers, and means connecting said shaft and said last mentioned cam to provide for said last mentioned cam an oscillatory motion in response to the rotation of said shaft.

2,482,237—Impregnating Paper Making Felts with Polyvinyl Alcohol Containing Emulsion. Orion William Berglund, Dayton, Ohio, assignor to The Orr Felt & Blanket Company, Piqua, Ohio. Filed October 24, 1946 — Issued Sept. 20, 1949.

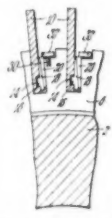
In a method of making felts for paper making or like machines, the steps of (*a*) impregnating the felts with a mixture consisting of from 20 to 67 parts by weight of a 15% polyvinyl alcohol solution and from 80 to 33% of a 60% equeous mixture of acrylonitrile butadiene copolymer; (*b*) removing any excess of said impregnating material from the felt by mechanical means so as to leave a pick-up of from 10 to 25% of cured material; and (*c*) curing said impregnated felt at a temperature of from 200 to 225° F. for approximately 3 hours.

2,482,549 — Method of Preparing Phenolic Materials from Lignin. Irwin A. Pearl and Louis E. Wise, Appleton, Wis., assignors, by mesne assignments, to The Institute of Paper Chemistry. Filed April 1, 1946 — Issued Sept. 20, 1949.

The method of preparing phenolic materials which comprises reacting a lignin substance with sodium chlorite in a hot, weakly acid, aqueous reaction mixture until the lignin goes into solution, acidifying the lignin solution to a pH of about 2, extracting the acidified mixture with a water-immiscible solvent and recovering the phenolic materials from the extract.

2,482,712 — Beater Roll. Dwight E. Jones, Pittsfield, Mass., assignor to E. D. Jones & Sons Company, Pittsfield, Mass. Filed September 27, 1945 —Issued Sept. 20, 1949.

A roll construction comprising in combination, a cylindrical unitary roll body, axially spaced circumferentially extending rings fixed to the periphery of said body provided with circumferentially spaced bar slots with the slots of said rings in alignment longitudinally of the body, said slots having parallel spaced apart flat faces and extending radially of the body with longitudinal center lines of said slots disposed in planes parellel to and extending through the longitudinal axis of the body, longitudinally extending bars in said slots having flat parallel outer and inner side faces with said outer faces contiguous with one face of said slots, the inner faces of said bars provided with keyways extending longitudinally thereof, inner and outer wedges constituting pairs thereof between inner faces of said bars and other side faces of said slots, said inner wedges having outer faces contiguous with the inner faces of the bars and provided with keys in the keyways of the bars and inner faces diverging relative to said outer faces from outer longitudinal edges thereof inwardly of said slots and radially of said roll, said outer wedges having outer faces contiguous with the other side faces of the slots and inner faces complemental to the inner faces of the inner wedges and converging relative to said outer faces from outer longitudinal edges inwardly of said slots and radially of said roll, said outer wedges adapted for movement inwardly of said slots and radially of the roll into wedging position for a wedging action on the inner wedges and bars to hold the same against outward radial movement, and securing means at outer sides of the slots adjacent the outer faces thereof engaging said rings and outer wedges to hold said outer wedges in wedging po-



sition and against outward radial movements, said securing means including screw members threadedly engaging said rings provided with heads engaging upper longitudinal edges of the outer wedges.

2,482,844—Cellulose Ether Manufacture. Alexander S. Finlayson, Rahway, N. J., assignor to Hercules Powder Company, Wilmington, Del. Filed October 6, 1945—Issued September 27, 1949.

In a process for the preparation of organic-solvent-soluble cellulose ethers, the steps which comprise mixing a preformed cellulose ether with etherification reaction ingredients comprising cellulose, alkali and an etherifying agent, and etherifying said cellulose in the presence of said preformed cellulose ether under conditions of temperature, pressure and agitation to produce an organic-solvent-soluble cellulose ether, said preformed cellulose ether being present in an amount from about 3 to about 15%, based on the weight of said cellulose, and said preformed cellulose ether containing the same substituent ether groups as those introduced into said cellulose by said etherification reaction.

2,482,895—Method of Making Paper Yarn. Edward J. Brockman, St. Louis, and Thomas M. Scruggs, Richmond Heights, Mo., assignors to Bemis Bro. Bag Company, St. Louis, Mo. Filed March 29, 1946—Issued September 27, 1949.

The method of making twisted wet strength paper yarn, comprising moistening a flat paper strip so as to soften and swell the fibers thereof, dispersing throughout the moistened strip a partially condensed resin adapted in its condensed form to waterproof the fibers of the strip, spinning the strip with the partially condensed resin and moisture therein to twist it into yarn before the evaporation of the moisture therein, removing moisture from the strip, and condensing the resin to its waterproof form so as to leave a coating of waterproofing resin on the fibers.

2,482,858 — Cellulose Purification. Mervin E. Martin, Cumberland, Md., and Morris Umansky, Summit, N. J., assignors to Celanese Corporation of America. Filed August 13, 1947—Issued September 27, 1949.

Process for the treatment of unbleached sulfite wood pulp, which comprises digesting sulfite wood pulp with a dilute aqueous alkaline solution, chlorinating the digested pulp, washing with a dilute aqueous alkaline solution, digesting the washed chlorinated pulp under super-atmospheric pressure in a dilute aqueous alkaline solution, and then subjecting said digested pulp to bleaching with an aqueous hypochlorite solution.

2,482,891—Solid, Stable Chlorine Dioxide Generating Compositions. Royden N. Aston, Niagara Falls, N. Y., assignor to Mathieson Chemical Corporation. Filed March 16, 1945—Issued September 27, 1949.

A stable, solid, substantially anhydrous composition consisting essentially of an organic acid anhydride, free of readily oxidizable substituents and a chlorite of the group consisting of the alkali and alkaline earth metal chlorites, the anhydride and chlorite being present in molar proportions within the range of 0.1:1 to 1:1.

2,482,755—Flameproofing of Fibrous Material. Florence M. Ford and William P. Hall, Wilmington, Del., assignors to Joseph Bancroft & Sons Co., Wilmington, Del. Filed May 29, 1945—Issued September 27, 1949.

In the art of producing a complex of acid and nitrogen with fibrous cellulose or protein materials or mixtures thereof to impart durable flame-resistance to such materials, the method of forming said complex which consists in impregnating the fibrous material with an aqueous solution of the reaction product of (1) at least one substantially water soluble inorganic acid compound selected from the class consisting of acids of phosphorus and sulfur which are free of metal and of organic groups and of constituents yielding active oxygen and halogen and which are substantially non-volatile under the conditions of the process, and metal-free salts of such acid compounds decomposable, and the anion of which is volatile, under the conditions of the process, to yield the acid, and (2) at least one non-metallic organic compound basic in the acid solution and soluble therein and which contains nitrogen and has an atomic ratio of carbon to nitrogen not substantially more than the ratio of carbon to nitrogen in acetamide, the amount of acid and the amount of non-metallic nitrogen-containing organic constituent applied to the material being equivalent to that applied by impregnating the material with a solution containing from 6.9% to 30% orthophosphoric acid by weight and containing a non-metallic nitrogen-containing organic constituent at least in amount sufficient to introduce the amount of nitrogen into the complex hereinafter set forth, with a 100% solution pick-up by weight of the fibrous material in the dry state; drying the material; heating the dried material to a temperature ranging from 400° F. to 250° F. for a time ranging from 30 seconds to 120 minutes; and then washing and drying the so heated material, the process being further characterized in that the solution composition is such that the pH of the heated fibrous material before said washing has a value of from pH 3 to pH 6, and in that the temperature and time selected in the above ranges and the amount of reaction product applied to the material and the amount of acid and nitrogen present in said reaction product are correlated to form with said material a complex containing an amount of the base element of the acid equivalent to from 1% to 5% phosphorus and to introduce into the said complex from .5% to 6% nitrogen, both by weight of the finally washed and dried material.

2,483,102—Container. George Stewart Vivian, Surbiton, England, assignor to Satona Limited, Edinburgh, Scotland. Filed—October 9, 1945—Issued September 27, 1949.

A container blank comprising a sheet of foldable material comprising four rectangular substantially equal-sized panels adapted to form the sidewalls, all of said panels being provided at the same end with integral bottom-forming extensions, said extensions having a length substantially equal to one-half the width of said sidewall panels, each of said bottom-forming extensions having a triangular section cut away, said cut-away section being defined by a line drawn from a point positioned half-way up the side of said extension and terminating at a point in the middle of the outer edge of said extension whereby the said extensions are folded in overlapping relation to form a bottom closure.

2,483,542 — Static Eliminator for Printing Presses. William J. Hooper, Elsah, Ill., assignor to Goss Printing Press Company. Filed October 24, 1945—Issued October 4, 1949.

In a press of the character effecting printing on a moving web of sheet material, as paper, means for neutralizing static electric charges on the web, comprising: first electrode means adjacent the path of movement of the sheet material on one side thereof, this means comprising a hot filament extending across the width of said web; second electrode means having a first portion on the same side of said web as the filament and a second portion on the opposite side of the web; and means for creating a substantial potential differential between said electrode means, both portions of the second electrode means having the same polarity with respect to the filament but the second portion being at a higher potential differential than the first, said potential differential being such as to cause electrically charged gas particles to move forward said second portion of said second electrode and contact a surface of said sheet material during such movement to vary the charge therein.

2,483,559—Process of Preparing Vanillic Acid. Irwin A. Pearl, Appleton, Wis., assignor, by mesne assignments, to Sulphite Products Corporation, Appleton, Wis. Filed May 29, 1947—Issued October 4, 1949.

The process of preparing vanillic acid which comprises subjecting a lignin substance at a temperature of at least about 50° C. to the oxidizing action of silver oxide in the presence of an aqueous solution of sodium hydroxide, acidifying the reaction mixture, extracting the acidified mixture with a water-immiscible vanillic acid solvent and recovering the vanillic acid from the extract.

2,483,605—Apparatus for Manufacturing Containers. Alvin A. Abramson, St. Louis, Mo., assignor to Central States Paper & Bag Company, St. Louis, Mo. Filed September 12, 1945—Issued October 4, 1949.

A bag-making machine comprising means for passing a sheet of bag-forming material along a predetermined path in a continuous web, means for applying hot adhesive to said web in defined areas, a chamber located along and around said path through which said web passes after it has received the application of the adhesive, a cooling coil associated with said chamber for cooling and dehumidifying the air within said chamber, blower means for circulating said refrigerated and dehumidified air in a continuously moving stream from the cooling coil over the surface of the web of bag-forming material as it passes through the chamber, a flat floor-forming plate in said chamber over which said web of bag-forming material slides as it moves through the chamber, and separate refrigerating units for respectively cooling said plate and said cooling coil.

2,483,672—Water Treating Apparatus. Merrill P. Robinson, Upper Montclair, N. J., assignor to Worthington Pump and Machinery Corporation, Harrison, N. J. Filed January 8, 1944—Issued October 4, 1949.

In a water treating apparatus of the type wherein precipitated foreign matter accumulates in the form of a filter bed for water being treated, the combination of a precipitation tank having an outlet for treated water and having a precipitation space therein, means for delivering raw untreated water into the precipitation space, means for withdrawing precipitated material from said tank to maintain a predetermined depth of the filter bed formed by the precipitation in the tank, means for delivering chemical reagent to said tank and means controlled by the flow of fluid through said chemical reagent delivering means for controlling the withdrawal of precipitation from the tank.

2,483,797—Tall Oil Acid Composition. Edward A. Van Valkenburgh, Greene, N. Y. Filed November 23, 1948—Issued October 4, 1949.

A tall oil acid composition containing from about 10 to 90% of the aliphatic amine soaps of tall oil acids and from about 90 to 10% of free tall oil acids, said composition being free from uncombined amine.

2,485,102—Cement Composition and Indurating Mixture Therefor. Donald R. MacPherson, University Heights, Wesley G. France, Columbus, and Fred M. Ernsberger, Ada, Ohio, assignors to The Master Builders Company, Cleveland, Ohio. Filed November 29, 1945—Issued October 18, 1949.

A dry cement composition comprising an hydraulic cement and 0.01% to 0.6%, based on the weight of the cement, of a waste sulfite liquor fraction consisting of membrane retained lignin residuum solids resulting from dialysis of waste sulfite liquor to remove the major portion of its content of water-soluble crystalloids without concentrating or chemically altering the waste sulfite liquor prior to dialysis.

2,483,806 — Waterproof Concrete Composition. Walter D. Buckley, Berkeley, and Paul E. McCoy, San Francisco, Calif., assignors, by mesne assignments, to Stancal Asphalt & Bitumuls Company, San Francisco, Calif. Filed September 18, 1946—Issued October 4, 1949.

A material of construction comprising a set, cured mixture of mineral aggregate, a setting agent selected from the group consisting of a Portland type hydraulic cement and gypsum plaster, and water, said mixture containing about 0.5-15% by weight of a freely flowing, full mixing, non-fermentable, non-grainy oil-in-water type emulsion capable of admixture with fine aggregates without breakdown, comprising 50-70% by weight of water-insoluble, water-dispersible high molecular weight, thermoplastic organic material

dispersed in 20-50% by weight of water and containing about 0.25-2.0% by weight of a high molecular weight substantially pure lignin derivative of waste sulfate black liquor, said substantially pure lignin derivative being water-insoluble; soluble in aqueous caustic solutions; substantially free of ash, water-soluble alkali metal salts and low molecular weight organic compounds; said emulsion having a pH of about 4.0-7.5, said material of construction having a 28-day compressive strength not substantially less than the 28-day compressive strength of said material without said emulsion.

2,483,860—Machine for Application of Sleeves to Valve Bags. Edric W. Vredenburg, Berkeley, Calif., assignor to St. Regis Paper Company, New York, N. Y. Filed July 31, 1945—Issued October 4, 1949.

In apparatus for applying supplemental sheets to form sleeves in valve bags, a rotatable table, and a plurality of sleeving devices disposed around the periphery of said table, each of said sleeving devices comprising a support for holding a supplemental sheet in position to be engaged by the spread valve corner of a bag, a substantially horizontal plate for supporting the bag with the spread corner thereof in engagement with a portion of said supplemental sheet, and a folder member operable upon rotation of said table to press another portion of the supplemental sheet against the spread corner of the bag so that said other portion engages and is retained in engagement with the spread corner, said folder member being releasable upon further rotation of said table to permit the bag to be removed from the sleeving device with the supplemental sheet in sleeve-forming position on the spread corner.

2,484,390 — Apparatus for Folding Paper and Like Material. James W. Thorpe, Dunstable, Sydney W. Bussell, Stanmore, and Sidney J. Herbert, Richmansworth, England, assignors to H. Reeve Angel & Co., Ltd., London, England. Filed February 25, 1949—Issued October 11, 1949.

In a machine for folding paper, having upper and lower jaws providing an opening therebetween for receiving a piece of paper to be folded, a plurality of movable folding blades mounted in each of said jaws and movable from said jaws into said opening to interleaf said blades with the blades of one jaw alternating with the blades of the other jaw, blade moving means for moving said blades into said opening for producing a series of oppositely directed folds in said paper and for returning said blades into said jaws after said folds have been formed, the improvement which comprises, an ejector for the folded paper being mounted on a shaft continuously rotatable in one direction about an axis spaced from said opening and having an ejector member passing through said opening in a direction laterally of said jaws during a part of the rotating of said ejector, and driving means to rotate said shaft in timed relation to the movement of said blades to pass said member through said opening to eject the folded paper after said blades have been returned into said jaws.

2,484,473—Paper Machinery. Stephen A. Staege, Hamilton, Ohio, assignor to The Black-Clawson Company, Hamilton, Ohio. Filed October 11, 1946—Issued October 11, 1949.

A control for maintaining a traveling member in a predetermined desired path of travel comprising a guide roll extending generally transversely of said path of travel and in running contact with said traveling member, means for adjustably mounting said guide roll to vary its angular relation to said traveling member to correct the path of travel of said member, means for sensing a departure of said traveling member from its normal path of travel, means controlled by said sensing means for effecting a substantial temporary movement of said guide roll in the angular direction to correct the path of travel of said member during the time said sensing means is actuated, and additional means controlled by said sensing means for producing a small retained movement of said guide roll in the same angular direction.

2,484,076 — Apparatus for Drying Paper. George L. Bidwell, Riegelsville, Pa. Filed November 21, 1946—Issued October 11, 1949.

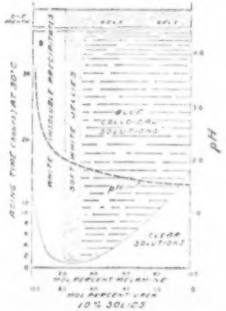
In a paper machine drier for drying a continuous running web of paper, in combination, a series of heated drying rolls over which said web passes, a pair of endless fibrous blankets in contact with opposite sides of said web as it passes over said drying rolls, said drying rolls being freely rotatable to equalize tension in said web in the direction of movement of said web as it is being dried, a plurality of driven heated rolls for preheating said blankets before they come in contact with said web, and means for drawing said blankets with said web therebetween over said heated drying rolls to hold said blankets firmly against said web and thereby prevent lateral shrinkage of said web while it is being dried.

2,485,020 — Combined Cutting and Creasing Dies for Paper Slotting Machines. Edwin G. Staude, Minneapolis, Minn., assignor to The Sperry Corporation, New York, N. Y. Filed November 5, 1945—Issued October 18, 1949.

In a machine of the class described a pair of complemental cutting and creasing heads, one of said heads comprising a member providing a cutting edge and an annular creasing surface, and means carried by the other of said heads including a knife and a creasing surface both cooperating with said cutting and creasing member to simultaneously slit and crease material fed between said heads.

2,485,079—Colloidal Melamine-Urea-Formaldehyde Copolymer Solutions. Henry P. Wohnsiedler, Darien, and Walter M. Thomas, Stamford, Conn., assignors to American Cyanamid Company, New York, N. Y. Filed January 4, 1944—Issued October 18, 1949.

A colloidal aqueous solution of a resinous copolymer of melamine, urea and formaldehyde



which contains 1 to 70 mol percent of urea and 30 to 99 mol percent of melamine and about 1 to 4 mols of combined formaldehyde for each mol of melamine + urea, said solution being acidified to a pH within the range of 0.25 to 4 by a content of 0.2 to 2.5 mols of hydrochloric acid for each mol of melamine, said resinous copolymer having a degree of polymerization such that the dispersed particles thereof are colloidal in character and size.

2,485,083 — Froth Flotation of Copper Sulfide Ores with Lignin Sulfonates. Robert B. Booth, Springdale, and Roy A. Pickens, Stamford, Conn., assignors to American Cyanamid Company, New York, N. Y. Filed January 4, 1946—Issued October 18, 1949.

In the concentration by froth flotation of copper sulfide minerals from a feed comprising copper and other heavy metal sulfides, the method of reducing the copper sulfide minerals content in the tailing, which comprises forming an aqueous pulp of the ore, subjecting the pulp to flotation in the presence of a promoter selected from the group consisting of a xanthate, dithiophosphoric acids and dithiophosphate types and 0.01-0.5 pound per ton of feed of a surface-modifying agent for the copper sulfide minerals, which agent is selected from the group consisting of the alkali and alikaline-earth metal lignin sulfonates and collecting the resultant froth concentrate.

2,485,136 — Bonding Rubber to Cellulosic Fibers. Edward A. Bried, Newport, Del., assignor to Hercules Powder Company, Wilmington, Del. Filed March 6, 1947 — Issued October 18, 1949.

The process of bonding a rubber to a fibrous cellulosic textile material which comprises contacting the cellulosic material with a material of the group consisting of an aqueous emulsion of a primary rosin amine, an aqueous solution of a primary rosin amine acetate, an aqueous solution of a primary rosin amine hydrochloride and an aqueous solution of a primary rosin amine hydrobromide, and applying to the treated cellulosic material a rubber latex in which the rubber is selected from the group consisting of natural rubber and synthetic rubberlike diolefin polymers.

2,486,050—Method of Forming Heat Insulation. Lewis B. Miller, Ambler, and Willard R. Seipt, North Wales, Pa., assignors to Keasbey & Mattison Company, Ambler, Pa. Filed May 8, 1944—Issued October 25, 1949.

The method of forming heat insulation comprising dry mixing particles of a binder with mineral particles and fibers evenly distributed in the mixture, spreading said mixture as an open fluffy layer sufficiently porous to be permeated by a subsequent moistening mist, atomizing water to form a mist and directing said atomized mist into said layer so as to penetrate and permeate the layer from surface to surface, limiting the amount of moistening mist to a range from 1½ to 3 times the weight of the dry mixture to thoroughly moisten the surfaces of the particles of the mixture and develop the adhesive bonds of the binder particles while maintaining the relative distribution of said binder particles in the mixture, accumulating a number of similarly spread and moistened layers of open fluffy mixture to desired amount, compressing the said accumulated layers of moistened fibers and particles to a predetermined thickness corresponding to a density not exceeding 60 pounds per cu. ft. while maintaining the distribution of the binder between the particles and fibers, and drying the said compressed mass into a light, porous self-sustaining unit of substantially said predetermined thickness and a density of about 3.9 to 15 pounds per cu. ft.

FINANCIAL RECORD

	Per Share Earnings			
PREFERRED STOCKS	Calendar Year 1948	12 Mo. to Approx. 9/30/49	Indic. Annual Divid. Rate	Dec. 20 Approx. Market Price
Armstrong Cork Co. $3.75 Cum.	$46.33*	$38.47*a	$3.75	$101¼
Armstrong Cork Co. $4.00 Cum. Conv.	46.33*	38.47*a	4.00	112⅜
Celotex Corp. 5% Cum.	26.42c	10.33p	1.00	17⅝
Champion Paper & Fibre $4.50 Cum.	99.97f	37.50j	4.50	97¼
Container Corp. of Amer. 4% Cum.	105.41	90.43	4.00	101¾
Crown Zellerbach $4.20 Cum.	63.92i	57.02q	4.20	103⅝
Dixie Cup Co. $2.50 Cum. Conv. Cl. A	10.10	10.44	2.50	51⅜
Flintkote Co. $4 Cum.	83.25	61.44	4.00	104⅛
Robert Gair Co., Inc. 6% Cum.	17.08	12.88	1.20	18⅜
International Paper Co. $4 Cum.	263.00	245.41	4.00	103
Johns-Manville $3.50 Cum.	209.89	204.89	3.50	127⅛
Kimberly Clark Corp. 4½% Cum.	80.74	70.92	4.50	104¾
Kimberly Clark Corp. 4% Cum. Conv. 2nd	41.59*	42.20*	4.00	103
MacAndrews & Forbes 6% Cum.	62.23	64.10	6.00	138½
Mead Corp. 4¼% Cum.	73.46	49.00k	4.25	81½
Mead Corp. 4% Cum. Conv. 2nd	29.91*	19.93k*	2.00	31¼
Paraffine Cos. Inc. 4% Cum. Conv.	156.11	74.77	4.00	101¾
Rayonier Inc. $2 Cum.	16.43	10.76	2.00	30⅛
St. Regis Paper Co. 4.40% 1st A	79.90	34.21	4.40	85¾
Scott Paper Co. $3.40 Cum.	59.06	52.36	3.40	106½
U. S. Gypsum Co. 7% Cum.	314.45	281.64	7.00	183⅞
United Wallpaper Inc. 4% Cum. Conv.	(d)0.79	15.43	2.00	26¼
West Virginia Pulp & Paper 4½% Cum.	79.45c	69.93p	4.50	108
COMMON STOCKS				
APW Products Co.	$0.73	(d)$1.01	(m)	2⅞
American Writing Paper Corp.	(d)0.15	0.05	$0.25	6½
Armstrong Cork Co.	7.54	6.13a	3.00	48⅞
Celotex Corp.	7.21c	2.75p	1.00	19⅝
Certain-Teed Prods. Corp.	4.02	3.89	1.00	15⅞
Champion Paper & Fibre	8.70f	3.20j	2.00	30½
Congoleum Nairn Co.	5.78	4.92a	2.00	27⅛
Container Corp. of America	10.12	8.50	4.00	38⅛
Crown Zellerbach	7.16i	6.33q	2.00	29⅛
Dixie Cup Co.	6.70	7.00	1.50	36⅞
Eastern Corp.	4.76	d0.07	(h)	15⅛
Flintkote Co.	5.86	4.14	2.50	30⅜
Robert Gair Co., Inc.	2.67	1.96	0.70	7⅛
Great Northern Paper Co.	4.63	5.21	2.80	40⅜
International Paper Co.	16.73	15.59	5.00	35½
Johns-Manville Corp.	5.22	5.07	2.50	47⅝
Kimberly Clark Corp.	5.02	4.32	1.65	24¼
MacAndrews & Forbes Co.	3.68	3.79	2.50	41¼
Marathon Corp.	4.11c	3.42p	1.40	24⅜
Mead Corp.	6.36	3.98k	1.00	15⅝
National Container Corp.	2.28	1.04	0.40	7⅛
Paraffine Cos. Inc.	2.45	1.15	1.20	20⅜
Rayonier, Inc.	9.09	5.52	2.00	25⅞
Ruberoid Co.	10.62	8.43	3.25	55⅛
St. Regis Paper Co.	2.71	1.02	0.60	8⅛
Scott Paper Co.	4.15	5.38	3.00	66½
Sutherland Paper Co.	6.02	5.12	2.50	39⅞
Union Bag & Paper Corp.	9.17	5.36	3.00	28⅛
United Board & Carton	2.04b	(d)1.61g	(e)	7⅞
U. S. Gypsum Co.	15.04	13.43	9.00	114
United Wallpaper	(d)0.10	0.42	(n)	3½
West Virginia Pulp & Paper	11.33c	9.70p	3.00	49⅞

(a) 12 months to approximately 6/30/49
(b) Year ended 11/23/48
(c) Year ended 10/31/48
(d) Deficit
(e) Omitted dividend 2/4/49
(f) 11 months to 3/31/49
(g) 12 months to approximately 11/13/49
(h) Directors took no action on August, 1949 dividend—last payment 5/2/49
(i) 12 months to approximately 1/30/49
(j) 6 months to 9/30/49
(k) 12 months to approximately 10/2/49
(m) Directors took no action on July, 1949, dividend—last payment 1/10/49
(n) Last payment 25c, 9/16/47
(p) 12 months to approximately 7/31/49
(q) 12 months to approximately 10/30/49
(*) Earnings per combined preferred shares.

Dividends Declared

Price Bros. & Co. has declared an extra dividend of 50 cents a common share along with the usual semi-annual payment of $2, both dividends payable February 15 to stockholders of record January 16. A similar extra was paid on the common stock August 1 and brings total disbursements in respect to 1949 to $5 as compared with $6 for 1948.

Strathmore Paper Co. declared a regular quarterly dividend of 25 cents on the common stock and a regular quarterly dividend of $1.50 on the 6 percent preferred stock, both payable January 3 to stockholders of record December 29.

Simplex Paper Corp. has declared an extra dividend of 20 cents per share and a regular quarterly dividend of 20 cents per share both payable to stockholders of record on December 22.

St. Lawrence Paper Mills has declared a dividend of $1.50 per share on first preferred stock and another dividend of 60 cents on second preferred stock, both payable January 25, 1950, to stockholders of record on January 4, 1950.

St. Lawrence Corp., Ltd., has declared a dividend of 50 cents per share on first preferred stock and another dividend of 18¾ cents on second preferred stock, both payable January 25, 1950, to stockholders of record January 4, 1950.

Bathurst Power & Paper Co.'s additional 25,000 Class "B" shares have been admitted to trading on the Montreal Curb market. The company has issued 25,000 B shares at $5 a share, increasing number of B shares outstanding to 325,000.

Chase Handles Hudson Pulp Transfer

NEW YORK — The Chase National Bank has been appointed transfer agent of the 5.12 percent cumulative preferred stock, series B, $25 par value of Hudson Pulp and Paper Corp.

St. Regis Paper Co. reports business in many directions underwent important readjustments during the current year and earnings of the company will reflect the adverse effect of these conditions. Present indications are that the company's net sales for 1949 will be approximately 25 percent under the $162,673,925 reported for 1948.

Building

- **FOR THE PAPER**
- **INDUSTRY**

We design, build, and equip paper and pulp mills ... steam generating plants ... and facilities for eliminating stream pollution.

Under one contract and one responsibility, we deliver jobs complete, ready for operation.

We also furnish engineering reports and surveys. Current cost data available at all offices.

The H.K. Ferguson Co.
INDUSTRIAL ENGINEERS AND BUILDERS

THE FERGUSON BUILDING • CLEVELAND, OHIO
OFFICES IN NEW YORK, HOUSTON, CHICAGO, CINCINNATI AND LOS ANGELES

PRICES

The prices below reflect general market quotations at the mill level on the standard grades in which the normal volume of business is being done. Does not include occasional spot offerings.

NEW YORK

Delivered Ports

Standard News, per ton—

Rolls, contract	$100.00/	—
Sheets	115.00/	—

F.o.b. Mills, Carload freight allowed, dock N. Y.

Kraft— per cwt., 40# base wgt.

Standard Wrapping Rolls	$6.50/	—
No. 1 Wrapping Rolls	7.25/	—
Standard Bag	6.00/	—

Tissues— per ream 24x36 (480) 10 lbs. 2500 lbs. or more

Wh. No. 1 Frd.	$1.55 /	—
Wh. No. 1 M. G.	1.50 /	—
Wh. No. 1½	1.35 /	1.40
Wh. No. 2	1.10 /	1.20
Kraft Anti-Tar	1.37½/	—
White Anti-Tar	1.75 /	—
Shrd. Wh. No. 1 per lb.	.11½/	—

Toilet— per case of 100 rolls—1 M sheets.

Unbleached 4½x4½	$5.75/	—
Bleached 4½x4½	6.95/	—
Bleached 4½x5	8.80/	—
Per Case of 50 rolls—2000 sheets		
Unbleached 4½x4½	$3.75/	—
Bleached 4½x4½	6.80/	—
Per Case of 100 rolls—1000 sheets		
Facial, 4½ x 5, 2 ply	$8.95/$9.45	

Paper Towels—per case of 3750.

Wh. Jr. M'tif'd 9¼x9½	$5.25
Br. Sr. M'tif'd 10x12	3.60
Br. Jr. M'tif'd 9½x9¾	3.10
Br. Jr. Sgl. fold 10x10¾	3.15
Blchd. 7½ x 11, 24/25 rolls	$3.95/$6.25

Manila, per cwt.

No. 1 Jute Tag 40 lb., sheets*	$15.05/$17.50
Reg. Jute M.F. Manila, sheets*	13.50/ 15.50
Wrapping Manila	8.75/ 10.50
Printing Manila	10.00/ 11.00

* Less usual allowance for rolls.

Boards, per ton—

Filled News	$72.50/$75.00
Plain Chip	70.00/ —
Blchd. Mla. Ld. Chip*	97.50/ —
White Pat. coated*	115.00/ —
Kraft Liners 42 lb.	100.00/
Kraft Corr. .009	105.00/
Binders Boards	110.00/116.00

* Base Prices per 10 tons. Less than 10 ton but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

WORLD WOOD PULP MARKETS

First Quarter Contract Prices, Per Short Air-Dry Ton

	Delivered, with varying freight allowance		Full freight allowance* On dock Atlantic Ports		
	U. S.	Canadian	Swedish	Finnish	Norwegian
Groundwood	$65.00/ —	$65.00/ —			
Soda, Bleached	113.00/ —	113.00/ —		Competitive	
Sulphate, Bleached	118.00/126.00	126.00/ —	125.00/128.00		
Sulphate, Unbl'd North'n		82.50/105.00	82.50/ 85.00	with	
Sulphate, Unbl'd South'n	80.00/ 82.50				
Sulphite Blchd. (S'ftw'd)	118.00/ —	118.00/ —	118.00/ —	Domestic	Competitive
Sulphite, Blchd. (H'dw'd)	113.00/ —				
Sulphite, Unbleached	100.00/ —	100.00/ —	100.00/ —	Grades	
Sulphite, Unbl'd (Glassine)	105.00/ —	105.00/ —	104.00/105.00		

* Ex dock quotations average $5.00 lower.

WASTE PAPER MARKET

Prices to Mills*, (Per Ton) F.o.b. Cars Shipping Point

	New York	Philadelphia	Boston	Chicago
	Dec. 13	Dec. 5	Dec. 1	Dec. 5
No. 1 Mixed Paper	$11.00/$12.00	$ —/$10.00	$9.00/ —	$10.00/ —
Boxboard Cuts	11.00/ 12.00	7.00/ 8.00	— / 5.00	13.00/ —
Mill Wrappers	11.00/ 12.00	10.00/ 11.00	— / 9.00	12.00/ —
No. 1 News	14.00/ 15.00	10.00/ 12.00	11.00/ 12.50	18.00/ —
Over-issue News	16.00/ 17.00	12.00/ 15.00	8.00/ 10.50	21.00/ —
Corrugated Containers	19.00/ 20.00	16.00/ 18.00	14.50/ 15.50	20.00/ —
New Corrugated Cuts	20.00/ 22.00	20.00/ —	16.00/ —	23.00/ —
Double Kraft Ld. Corr. Cuts	34.00/ 35.00	30.00/ 35.00	25.00/ —	40.00/ —
Used Kraft Bags	28.00/ 30.00	25.00/ —	25.00/ 30.00	20.00/ —
No. 1 Brown Kraft Paper	30.00/ 35.00	25.00/ 30.00	30.00/ 35.00	20.00/ —
Super Resorted Br. Kraft	35.00/ 38.00	30.00/ 35.00	40.00/ —	35.00/ —
New Br. Kraft Envr. Cuts	65.00/ 70.00	60.00/ 65.00	60.00/ 65.00	55.00/ —
New Br. Kraft Cuts	40.00/ 45.00	50.00/ —	45.00/ —	50.00/ —
No. 1 Gdwd. Shvs.	25.00/ 30.00	18.00/ 22.00	25.00/ —	28.00/ —
White Newsblanks	55.00/ 60.00	50.00/ 55.00	50.00/ 55.00	37.00/ 40.00
No. 1 Flyleaf Shvs.	30.00/ 35.00	— / 30.00	35.00/ 45.00	35.00/ —
No. 1 Soft Wht. Shvs.	80.00/ 85.00	65.00/ 70.00	70.00/ 80.00	55.00/ —
Super Soft Wht. Shvs.	85.00/ 90.00	70.00/ 75.00	80.00/ 90.00	60.00/ —
Hd Wht. Shvs.	90.00/ 95.00	80.00/ 85.00	80.00/ 90.00	80.00/ —
Hd. Wht. Env. Cuts.	105.00/115.00	90.00/ 95.00	90.00/105.00	90.00/ —
New Manila Env. Cuts.	65.00/ 70.00	60.00/ 65.00	60.00/ 70.00	55.00/ —
Col. Tab Cards	35.00/ 40.00	20.00/ 25.00	35.00/ —	40.00/ —
Manila Tab Cards	70.00/ 75.00	65.00/ 70.00	75.00/ 80.00	65.00/ —
No. 1 Mixed Ledger	35.00/ 40.00	30.00/ 35.00	37.50/ —	40.00/ —
White Ledger	45.00/ 50.00	45.00/ 50.00	50.00/ 60.00	50.00/ —
Mixed Books & Mags.	12.00/ 13.00	10.00/ 12.00	12.00/ —	12.00/ —
No. 1 Rep'd Hvy. Books & Mags.	20.00/ 25.00	20.00/ —	22.00/ 23.00	23.00/ —

* Includes brokers' fee.

The following prices are representative distributors' resale prices:

Rag Content Bonds and Ledgers—
White, 20 lb.

Bonds

	4 Ctns.
	per cwt.
100% Rag Ex. No. 1	$51.40/$53.90
100% Rag	44.55/ 46.15
75% Rag	33.90/ 35.40
50% Rag	28.10/ 29.55
25% Rag	24.85/ 26.80

Ledgers

	4 Ctns.
	per cwt.
100% Rag Ex. No. 1	$52.65/$54.55
100% Rag	45.65/ 46.40
75% Rag	35.15/ 36.10
50% Rag	29.40/ 30.05
25% Rag	26.15/ 26.80

Sulphite Bonds and Ledgers
White, 20 lb.

Bonds

	4 Ctns.
	per cwt.
Watermarked	$16.55/$17.50
Plain	15.60/ 15.95

Ledgers

	4 Ctns.
	per cwt.
Watermarked	$18.05/$18.80

White Book

Conversion Coated	Case
	per cwt.
No. 1	$19.75/$20.90
No. 2	19.25/ 19.65
No. 3	17.75/ 18.90
Machine Coated	
No. 1	16.40/ 16.65
No. 2	14.40/ 15.15
Uncoated	
No. 1 Antique (Watermarked)	16.40/ 17.90
Offset	15.15/ 16.65
A Grade E. F.	15.40/ —
A Grade S. C.	15.90/ 16.15
B Grade E. F.	14.90/ 15.15
B Grade S. C.	15.40/ 15.65

Rag Market

New Domestic Cotton Cuttings
(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
White Shirt	$10.00/ $10.75
Unbleached Muslin	9.75/ 10.50
Light Silesias	6.50/ 7.50
White Back Blue Overalls	5.50/ 6.25
Blue Overalls	4.50/ 5.00
Fancy Shirt	4.50/ 5.00
Percales	5.50/ 6.00
Light Prints	5.50/ 6.00
No. 1 Washables	2.75/ 3.00
Bleachable Khaki	4.50/ 5.00
Unbleachable Khaki	3.75/ 4.50
Cottonades	4.00/ 4.75
Lt. Flannelettes	6.75/ 7.25
Men's Corduroy	3.50/ 4.25
Women's Corduroy	3.00/ 3.75
Canton Flannels, Blchd.	8.50/ 9.00
Underwear Cutters, Blchd.	10.75/ 11.25
Underwear Cutters, Unblchd.	10.50/ 11.00

Old Domestic Cotton Rags
(Prices to Dealers, F.o.b. Ship. Pt.)

	Per 100 lbs.
No. 1 Whites, Repacked	$4.25/ $4.75
No. 1 Whites, Miscellaneous	3.50/ 4.00
No. 2 Whites, Repacked	2.75/ 3.00
No. 2 Whites, Miscellaneous	2.00/ 2.25
Cotton Pants & Overalls	2.25/ 2.75
Thirds and Blues, Repacked	2.00/ 2.75
No. 1 Roofing Rags	1.50/ 1.60
No. 2 Roofing Rags	1.40/ 1.50
No. 3 Roofing Rags	1.25/ 1.30
No. 4 Brussels & hrd. Bck'd crpts.	1.25/ 1.30
Roofing Bagging	.80/ .95

New Foreign Cotton Cuttings
(Prices to Mills, F.o.b. Dock, N. Y.)

	Per 100 lbs.
New Dark Cuttings	$2.75/ $3.00
New Mixed Cuttings	2.75/ 3.00
Light Silesias	6.50/ 7.00
Light Flannelettes	5.50/ 6.00
New White Cuttings	10.00/ 10.50
New Unbleached Cuttings	10.00/ 10.50

Fancy Shirt Cuttings	4.50/	4.75
Light Prints	4.25/	4.50
Bleachable Khaki, No. 1	4.25/	4.50
Unbl. Khaki, No. 1	4.00/	4.25

Old Foreign Rags

(Prices to Mills, F.o.b. Dock, N. Y.)

	Per 100 lbs.	
No. 1 White Cottons	$6.50/	$7.00
No. 2 White Cottons	5.50/	6.00
No. 3 White Cottons	4.00/	4.50
No. 4 White Cottons	3.00/	3.50
Extra Light Prints	4.50/	5.00
Old Light Prints	4.00/	4.25
Med. Light Prints	2.50/	2.75
Dutch Blue Cottons	3.25/	3.50
Cnecks and Blues	2.75/	3.00
Linsey Garments	2.10/	2.40
Dark Cottons, European	2.00/	2.10
Dark Cottons, Egyptian	1.85/	2.00
Old Shopperies	1.75/	1.85
New Shopperies	2.00/	2.25

Bagging

(Prices to Dealers, f.o.b. N. Y.)

	Per 100 lbs.	
Foreign Gunny	$5.50/	$6.00
Domestic Gunny, No. 1	5.50/	6.00
Heavy Wool Tares	6.00/	6.50
Foreign Manila Rope	4.50/	4.75
Domestic Manila Rope	4.25/	4.50
Jute Strings	5.50/	5.75
No. 1 Sisal Strings	4.50/	4.75
Mixed Strings	1.15/	1.30
Heavy Baling Bagging	7.50/	8.00
Paper Mill Bagging	4.00/	4.25
No. 1 Scrap burlap		
Foreign	4.25/	4.75
Domestic	4.50/	5.00
Austr. Wool Pouches	6.50/	7.00
New Burlap Cuttings	6.00/	7.00

MATERIALS

Blanc Fixe

Prices on by-product rise $2.50, Jan. 1. Heavy demand. Supply adequate. Currently quoted at $90.00 in bags, car lots, at works, 6 cents per pound, l.c.l., deld. By-product supply somewhat restricted. Quoted at $80.00 per ton, car lots, at works, 6 cents per pound, l.c.l., deld.

Bleaching Powder

Demand improved. Prices steady. Prices range from $4.50 to $5.00 per 100 pound drums, l.c.l., works.

Casein

Argentine flush season underway. Production good. Demand quiet. Loss of Japanese order weakens prices ½ cent. Current prices on processed acid precipitated grades 22½ to 24 cents, imported grades 18-18½ cents, ex dock, N. Y. car lots.

Caustic Soda

Demand heavier. Stocks adequate for prompt shipment. Contract prices for 1950 unchanged. Solid caustic is reported at $3.05 per cwt. flaked and ground is quoted at $3.45 per cwt., in 400 pound drums, $3.95 per cwt. in 100 pound drums —car lots, at works; liquid 50 percent in tank cars at $2.40 per cwt.; liquid 73 percent in tank cars at $2.50 per cwt., at works.

China Clay

Demand strong. Supply of domestic and imported ample. Domestic airfloated filler quoted at $10 per ton, water-washed $11.00, car lots, f.o.b. mines. Coating clay is $16 to $30. Imported clays repriced to $15.20 and $28.35 short tons, export warehouse.

Chlorine

Supply continues tight. No early easing seen. Demand strong. Prices firm at present levels for 1950 contracts. Currently quoted at $2.40 per cwt. in single unit tank cars; at $2.70 to $3.90 per cwt. in multitank cars, f.o.b., works.

Rosin

Trading dull. Production at seasonal ebb. Appeal planned on Government support level. Prices unchanged. Gum rosin in drums, per 100 pounds net in car lots, f.o.b. Savannah, B, $5.75; G, H, I, $6.45; K, $6.46; wood rosin, per 100 lbs., car lots, f.o.b. Savannah; B, $4.25; FF, $5.50.

Rosin Size

Demand steady. Supply good. Seventy percent gum and pale wood grades, tank cars, $5.54 to $5.70 f.o.b. southern shipping point.

U. S. IMPORTS WOODPULP

Preliminary, November, 1949

Item	Country of Origin	Short Tons
Mechanical		
Unbleached	Canada	19,623
	Sweden	227
	Austria	229
	Finland	2,868
		22,947
Screenings	Canada	357
Chemical		
Sulfite, Unbleached	Canada	27,004
	Sweden	20,907
	Czechoslovakia	105
	Finland	7,518
		55,534
Screenings	Canada	284
	Finland	55
		339
Sulfite, Bleached, Rayon & Special Chem. Grades	Canada	16,113
	Sweden	249
	Czechoslovakia	448
		16,810
Other	Canada	26,069
	Sweden	9,959
	Norway	9,099
	Austria	541
	Finland	3,188
		48,856
Sulfate, Unbleached	Canada	11,751
	Sweden	16,207
	Norway	164
	Finland	21,224
		49,346
Sulfate, Bleached	Canada	30,631
	Sweden	10,214
		40,845
Soda, Unbleached & Bleached	Canada	2,763
Totals, November	Canada	134,595
	Sweden	57,763
	Finland	34,853
	Norway	9,263
	Austria	770
	Czechoslovakia	553
		237,797

Soda Ash

Demand improved; supply adequate. Current prices, car lots per 100 pounds; light ash in bulk, $1.00; in paper bags, $1.25.

Starch, Corn

Moderate domestic demand and export orders cut supply. Prices guaranteed against further rises to Jan. 1. Demand strong. Supply ample. Pearl grade currently quoted at $4.87 per 100 pounds; powdered starch at $4.98 per 100 pounds; white corn dextrine at $6.14 per 100 pounds; car lots, f.o.b. Chicago.

Starch, Potato

Heavy paper demand. Slight easing of supply in Maine noted. Idaho likely to remain tight. Prices nominal. Idaho high grade quoted at $7.25 cwt. l.c.l., ex N. Y. whse. New production quoted at $5.25 cwt., car lots, f.o.b. shipping point. Maine production quoted at $5.00 cwt. f.o.b. shipping point.

Sulphate of Alumina

Demand steady. Prices firm. Supply good. The commercial grades are quoted from $1.50 per 100 pounds, in bags, car lots, f.o.b. works. Iron free is $2.75 per 100 pounds in bags, car lots, at works.

Salt Cake

Demand from kraft mills heavier. Supply adequate. Domestic quoted at $22.00/$24.00, f.o.b. shipping point, freight allowed to destination.

Sulfur

Supply ample. Demand sustained at good level. Prices firm. Annual contracts are quoted at $18 per long ton, f.o.b. mines; $19.50, f.o.b. vessels, Gulf ports. Export price f.o.b. Gulf ports is $22.00 per long ton.

Talc

Demand continues far ahead of supply. Prices steady. Domestic grades are currently quoted at $23 to $28 per ton in 50-lb. paper sacks, car lots, f.o.b. mills; Canadian at $35 and up per ton.

Tapioca Flour

Supply liberal. Fair demand. Prices ease slightly. Dextrinizable grades range from $9.00/$9.75 cwt.: for superior high grades to $8.25/$8.75 cwt.; for highs, on dock Atlantic and Gulf ports. Medium grades range from $6.50 cwt. on dock, N. Y., and are tight in supply.

Titanium Dioxide

Stocks ample. Demand strong. Prices firm. Anastase 19½c pound carload lots, 20c l.c.l., rutile, 21½c pound carload lots, 22½c l.c.l.; 50-pound bags, f.o.b. plant, actual freight allowed.

GOVERNMENT

Business and Government Relations

WASHINGTON, D. C. — Secretary of Commerce, Charles Sawyer, has announced that the first task of the new interagency committee on competition and monopoly will be to frame an overall executive policy in this field for the guidance of all Government agencies, and a plan for coordinating federal activities in carrying out the policy. In performing this task, existing legislation, including exemptions from the anti-trust laws, will be reviewed, and existing responsibilities of all affected agencies re-examined.

The new group appointed under President Truman's directive to the Commerce Secretary will be known as the "President's Committee on Business and Government Relations." Its job is to present a proposed program of action to the President in the field of monopoly, competition, and restraints of trade.

The program will be designed as a supplement to, and in no way a substitute for, vigorous enforcement of the anti-trust laws. It is to embrace possible revisions in legislation, improvements in administrative procedures, and strengthening of Government policies, with considerable emphasis being placed upon measures to strengthen the competitive position of small and independent business.

The members of the President's Committee have agreed upon three basic objectives to serve as guideposts for their activities. Mr. Sawyer reported: 1. To stimulate the spirit and practice of competition in the business world. 2. To strengthen and broaden Government efforts for the prevention of monopoly, and restraints of trade. 3. To build a sound basis of mutual understanding in the relations between business and Government.

(Continued from page 7)

similar products; plastic linings providing wider versatility on some items for packaging foods; and the printing of safety slogans on paper drinking cups for industrial use are stimulating demand. Paper milk bottle production tends upward, experiencing a seller's market. Some additional facilities are being installed to meet increasing demand. Fiber drums, cans and tubes are reported in spotty demand for the third quarter. Prices on most paper containers appear to have firmed, with the short-term outlook indicating a steady market.

November Newsprint Statistics

Production.—Total continental production of 507,615 tons during November, 1949, exceeded any November on record. Canadian output (includes Newfoundland) amounted to 436,766 tons, a 1.1 percent gain of 1948's November. Production rate was 101.2 percent of rated capacity. U. S. production dropped 4.5 percent to 72,130 tons, compared against 75,518 tons in the preceding November. For the 11 months of 1949, Canadian mills showed a gain of 4.4 percent or 198,909 tons; U. S. output increased by 2.3 percent or 18,441 tons; making for a total North American increase of 4.1 percent over like period of 1948, greater than in any preceding similar period.

Consumption.—U. S. estimated consumption in November was 479,273 tons, a gain of 12,282 tons or 2.6 percent over November, 1948. (This includes all kinds of uses of newsprint.) Consumption by daily newspapers reporting to ANPA amounted to 378,626 tons, an increase of 3.9 percent over November, 1948, 364,253 tons with an equal number of Sundays. U. S. supply for the month was made up of 462,055 tons from Canadian and U. S. mills and 11,000 from Europe. The total of 473,055 tons compares with 456,032 tons in November, 1948.

Stocks.—U. S. consumer stocks increased by one day's supply to 47 in November, compared with October, 1949—at projected rate of consumption. Stocks of newsprint paper on hand at Canadian mills at the end of November were 140,870 tons, at U. S. mills 13,215 tons, a combined continental total of 154,185 tons, compared with 178 on October 31, 1949.

Britain Prohibits Canadian Newsprint

TORONTO—The inability or refusal of the British government to purchase Canadian newsprint during the year 1950, a few weeks ago looked upon as a possibility and then a probability, has now become a certainty. Newsprint sources in London confirmed on December 15 that Britain has told Canada she will not buy newsprint in 1950, but will import a certain amount of Canadian pulp for use in her own mills. "This will be a serious blow to the Canadian newsprint industry," declared an economist on hearing of the confirmation. "Other newsprint markets are tightening up at the same time."

Officials who closely study the newsprint situation say they doubt if there will be a drop in the price of newsprint for at least six months. It might well come then, unless Canadian producers start curtailing production as soon as a surplus condition threatens.

Britain, before the war, was Canada's second largest market. Canada and Newfoundland combined shipped each year more than 300,000 tons of newsprint between 1935 and 1939. When British supply sources in Scandinavia were cut off during the recent war, Canada expanded her facilities to take care of supplying all Britain needed. After the war, British publishers came here, in 1946, and with the approval of the British government, negotiated long-term contracts for 250,000 tons a year. Later, Britain insisted these be cut to 100,000 tons a year and shipments have been about this level ever since.

Britain is now able to pull out of the Canadian market, as for the first time Scandinavian producers have newsprint at a competitive price. In addition, they have very large supplies that they are willing to sell for sterling. When Britain came here in 1946, Canadian producers turned down chances for other long-term markets in favor of Britain, and they feel they have a legitimate claim for a great deal of consideration from the British.

Anything that would hit this industry affects a considerable segment of Canadian economic life. The pulp and paper industry is greater than all mineral production combined. The value of Canada's pulp and paper accounts for more than 20 percent of all Canadian exports. Spokesmen for this industry stress that pulp and paper isn't only Canada's largest industry; it is its most valuable one. It stands first in production, first in exports, first in employment, first in total wages paid and first in capital invested.

Newsprint sources in Britain, in confirming the decision of the government to prohibit imports of Canadian newsprint during the coming year, said that because of Britain's dollar shortage the contracts with Canada for 100,000 tons of newsprint for 1950 would have to go by the board. The contracts meant from $10 million to $11 million. At the same time the same source said Britain has closed a deal to take 120,000 tons from Scandinavian sources and 10,000 tons from new sources in the Netherlands and France. This year Britain took 85,000 tons of Scandinavian newsprint and 100,000 tons from Canada. The 1949 Canadian contracts will be completed.

Spokesmen for the industry said shifts in the markets might mean that Australia cannot get newsprint through Britain. There have been reports that in this event Australia plans to import some 35,000 tons from Canada next year, paying in dollars.

Britain's decision was said to have been taken despite pressure from British newspapers to expand from a six- to a seven-page maximum. The latest proposals by Canada and the British newspaper owners that Britain continue to import a certain amount of newsprint to "keep open the lifeline" has been rejected. Details of the Canadian proposal could not be learned here but it was said to revolve around an arrangement by which Britain would not have had to meet the devaluation difference from her dollar pool. Devaluation made Canadian newsprint more expensive for Britain.

Swedish Supply of Newsprint

In the foreseeable future, Swedish supplies of newsprint and pulp will have negligible effect on prices in the North American market, in the opinion of Frederick Palmer, Commercial Counsellor to the Canadian Legation in Stockholm. A British journal quotes Mr. Palmer as saying: "In the first place, production is limited to a forestry replacement basis, so that no great expansion of production is probable. Further, the price basis for exports, particularly after depreciation of currency, is more attractive in the markets outside the dollar area."

Canadian Newsprint Shipments

OTTAWA — Canadian shipments of newsprint for export during November this year totaled 432,651 tons, up substantially from the year ago figure of 415,768, according to the Newsprint Association of Canada. Shipments for the first 11 months of 1949 advanced to 4,424,517 tons from last year's 4,246,419 for the like period.

Shipments for export to the United States in November amounted to 391,514 tons against last year's 359,734. Shipments destined for the Central American and Caribbean area showed a wide increase at 15,121 compared with 8,801 but shipments for the British Isles declined to 9,916 from last year's 11,517, while exports to Australia and New Zealand dropped to 10,132 from 21,694.

Exports to the United States for the 11-month period totaled 3,996,069 tons compared with 3,757,668 a year ago. Principal shipments to other countries this year to the end of November were as follows, with year-ago figures in brackets: Central American and Caribbean area, 102,910 (97,168); South American, 30,059 (86,705); British Isles, 115,079 (111,962); other European countries and the Balkans, 8,432 (481); Mediterranean and Near East, 3,270 (8,586); Africa, 54,242 (49,362); India and Middle East, 19,422 (20,924); Orient, 22,094 (36,971); Australia and New Zealand, 72,814 (76,461).

October Production Gains

WASHINGTON, D. C. — Important October production gains, compared with September, were reported by Bureau of Census this week for soda ash, caustic soda, sodium sulfate and sulfuric acid, among others.

* Source: NAC, NSB, ANPA.

Production of soda ash for October and September respectively showed the following: ammonia soda process, total wet and dry, 328,899 short tons against 317,406; natural, 20,758 short tons against 16,915.

Other production reported for the two respective months showed: sodium sulfate, anhydrous, refined, 12,199 short tons against 9,712; glauber's salt, 14,982 short tons against 12,235; crude salt cake, 42,014 short tons against 37,142.

Caustic soda production for October and September showed: electrolytic process, liquid, 144,243 short tons against 139,655; solid, 18,235 against 19,657 short tons; lime-soda process, liquid, 45,124 short tons against 42,488; solid, 15,049 short tons against 10,804.

Canadian Carloadings

OTTAWA—The Canadian Government reports cars of revenue freight loaded on the railways showed 4,217 of woodpulp and paper for the week ending December 10 this year compared with 4,307 in preceding week, though below the 4,492 in the similar week a year ago.

The Eastern Division accounted for 3,658 cars of woodpulp and paper in the week ended December 10 as against 3,729 in the previous week or 3,855 in the corresponding week last year, with the Western Division declining to 559 in the week ended December 10 this year compared with 578 in the preceding week and 637 in the similar week a year ago.

Such car loadings in the period from the first week of 1949 until the week ended December 10 showed a decline to a cumulative total of 192,463 as compared with 208,789 in the similar period last year, with the Eastern Division accounting for 168,187 cars of woodpulp and paper against 181,269 last year and the Western Division for 24,276 compared with 27,520 a year ago.

Canadian Security Report

OTTAWA — The Canadian Government reports security prices of pulp and paper stocks advanced to 259.0 in October, 1949, compared with 240.1 in September, 1949, for a gain of 18.9, though these declined 7.9 as against the 266.9 of October, 1948, on the base of 1935-39 being 100.

Such pulp and paper securities showed the third successive gain of 1949 in October, with the upward trend having commenced in July when stocks registered 221.4 against 210.6 in June and continued to rise to 230.6 in August, 240.1 in September and 259.0 in October. Earlier this year there was a steady downward movement in such security prices, starting with 257.1 in January and dropping continuously month after month, such as 244.1 in February, 236.7 in March, 234.2 in April, 227.4 in May, and 210.6 in June. Since the latter month the upward climb has continued uninterruptedly and is still continuing on the basis of the latest official report for October.

WOOD PULP: U.S. PRODUCTION, CONSUMPTION, INVENTORIES, OCTOBER, 1949

(Tons of 2,000 pounds)

Grade	U. S. Production: Tons	U. S. Production: % of Base	Consumption in paper & board manuf.: October	End of Month Inventories: At pulp mills, for later sale	End of Month Inventories: At paper & bd. mills: Oct.	End of Month Inventories: At paper & bd. mills: Sept.
Sulfite, Total	227,126	87.5	276,084		188,676	195,348
Blchd., Total	149,082		173,216	23,027	81,503	85,254
Dissolving & sp. chem.						
Softwood paper grds.	140,617		162,902		78,187	82,375
Hardwood paper grds.	8,465		10,314		3,316	2,879
Unbichd.	56,817		102,868	7,510	107,173	110,094
Sulfate, Total	365,878	93.9	645,631		132,579	138,598
Bichd.	93,616		141,220		65,358	63,500
Semi-bichd.	21,697		27,334		3,750	3,783
Unbichd.	399,606		477,077	1,857	63,471	71,315
Soda	44,343	88.2	49,474		11,731	13,687
Groundwood	164,579	73.1	189,429		30,128	29,786
All other	141,698	93.7	141,378		6,109	6,418
Totals	1,143,624	87.5	1,301,995		369,241	383,837

Based on Bureau of Census figures.

Oppose Change of Freight-Rate Basis

OTTAWA—A British Columbia Government proposal before the Royal Commission on Transportation's hearings, that there should be a radical change in the system of railway freight-rate making to bring in the "cost of service" principle instead of the now-accepted "value of service" basis, has been opposed by the Canadian Pacific Railway on the ground that using this "cost of service" basis would hit at low-valued traffic, including such basic commodities as forest products or lumber moving out of British Columbia. The "value of service" basis is generally founded on the ability of traffic to pay its way and charges are higher in relation to the value of traffic, while low-valued traffic is given a cheaper rate.

Paper and Printing Industries Report

WASHINGTON, D. C. — Publicly reported dividend payments by the paper and printing industries showed a combined total of $8,900,000 in October, 1949, compared with $9,700,000 a year earlier, the Commerce Department reported this week. Payments were not shown for the industries separately.

The department's "Selected Business Indicators" showed manufacturers' sales for paper and allied products amounting to $626,000,000 in October, 1949, compared with $644,000,000, based on revised estimates, for September. These figures compared with October, 1948, sales of $567,000,000.

Book value of inventories for paper and allied products in October, 1949, was given as $737,000,000 at the end of October, against $756,000,000 at the end of September, and $886,000,000 for October, 1948.

U.S. PAPER AND PAPERBOARD IMPORTS, SEPTEMBER, OCTOBER, 1948-1949

(In short tons except where otherwise indicated)

Item	September: 1949	October: 1948	October: 1949	First 10 months: 1948	First 10 months: 1949
Paper, Total	355,735	369,794	402,044	3,658,416	3,861,323
Printing, and book paper, uncoated	1,838	6,943	1,689	68,871	23,886
Fine paper, total	66	70	39	536	457
Writing paper	5	3	5	89	31
Cover paper	..	1	....	2	(1)
Bristols	18	1	1	8	64
Thin paper	35	61	29	397	295
Other fine paper	8	4	4	40	67
Wrapping, bag, and converting, total	241	464	234	16,599	3,598
Greaseproof	23	1	(1)	29	38
Vegetable parchment	2	1	(1)	14	9
Kraft wrapping	77	440	169	9,201	2,807
Wrapping, except kraft	139	22	65	7,355	744
Tissue and crepe paper	121	1	104	1,259	1,233
Absorbent paper	21	3	2	93	94
Building paper	38	15	66	295	347
Newsprint	353,410	362,298	399,910	3,570,763	3,831,708
Paperboard total	5,621	5,208	5,351	62,342	58,805
Kraft container board	....	....	....	611	....
Other container and boxboard	....	....	....	25	5
Other paperboard	3,662	3,064	3,341	36,362	40,510
Fiber insulation board	....	....	....	21	24
Wallboard	1,959	2,144	2,010	25,273	18,216
Paper products	329	526	302	5,159	3,949

CONVERTERS . . . .

(Continued from page 12)

Canadian Insulation Board

OTTAWA—The Canadian Government reports production of rigid insulating board in November amounted to 19,305,461 sq. ft., showing a moderate increase over last year's November total of 19,104,287.

Sales in the month totaled 18,079,786 sq. ft., 9.6 percent higher than last year's November total of 16,489,585 sq. ft. Eleven-month totals were higher for both production and sales, the former advancing to 205,570,449 sq. ft. from 199,585,805, and the latter to 200,398,572 sq. ft. from 169,090,641.

Gold Decalcomania Film

NEW YORK — Palm Fechteler & Co. reports that the use of gold for decalcomania purposes has taken a decided spurt with the development of a 23 K gold film application. Although gold effects have always presented a problem for such decal usages as gold striping, decorative display and other functions, this new type of gold application eliminates such problems as application, appearance, wear, tarnishing and mass production, it is claimed. It is possible to obtain this decalcomania film for gold striping or other forms of decoration in lengths up to 45″, in widths from ⅛″ to 2″.

Glaskraft in Full Production

BROOKFIELD, Mass. — Lee Turley, vice president in charge of sales, today announced that McLaurin-Jones' new heavy-duty sealing tape — Glaskraft, is now out of the experimental stage and in full production. This tape is said to be four to six times stronger than ordinary sealing tape. It consists of two sheets of kraft paper laminated with asphalt, in which glass fibers are imbedded for added strength. Thus, its average tear test is 55 to 60 (machine direction), as compared with a 14 tear test for 90 lb. kraft, and 65 to 70 (cross machine direction) as compared with a 15 tear test for 90 lb. kraft.

Glaskraft is recommended for sealing heavy cartons and cartons which contain valuable merchandise. It is claimed it will reduce breakage and carton rupture, that its fibers are not affected by dampness, and that it will not rot or weaken in storage. It is water-resistant and can be furnished with waterproof gumming.

Gair Addition Nears Completion

OTTAWA — The container plant of Gair Co. Canada Ltd. at London, Ont., is reported nearing completion of construction of a 33,000 sq. ft. extension which will house more modern equipment to get added production without much additional manpower.

Dennison Surveys Market

Dennison Manufacturing Co. of Framingham, Mass., will undertake a detailed analysis of its market in the first half of 1950 which should furnish some idea of when a plant in Champaign will be needed, James T. Dennison of the management said on December 12.

The company acquired a 20-acre tract several months ago at the northeast corner of Prospect and Bradley avenues as the site for a future plant.

Dennison said there is "nothing immediate by any means" contemplated for the local site. The company, he explained, is "under no great pressure" to open a new plant.

However, he said "we are delighted to have the property and we intend to keep it." Erection of a new factory, Dennison emphasized, "will cost a great deal of money and must be treated as a very major decision."

Dennison cited the fact that the statement last summer announcing the acquisition of the property here had stressed that building plans were extremely indefinite.

He referred to the prospects for use of the Champaign location as being "in the pre-planning stage." He conceded, however, that Dennison Manufacturing Co., a paper converter, is "bursting at the seams" in its Framingham plant.

It is impossible, Dennison added, to say what will grow out of the study of the company's present and future market.

This is

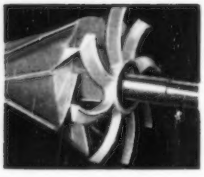
PULPING POWER

. . . in action!

This photograph (taken with stroboscopic light) can give only a hint of the tremendous agitating force produced by the Pulp Master.

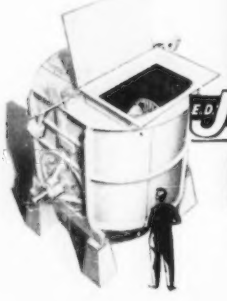
4-way action. Diagonal bars on the heavy rotor quickly break up whole charges, baled or loose. Cone shape of rotor forces stock against walls, where specially shaped impeller blades whirl and recirculate it. When pieces are sufficiently reduced they are rubbed between impellers and radial barred refining discs for thorough defiberization.

Complete disintegration of baled pulp, wastepaper, machine broke in 10 to 40 minutes. Efficient use of power and low maintenance cost make it extremely economical, too.



SEE IT IN ACTION

Four sizes, from 500 to 4,000 lbs. at 6½% density. Available for batch or continuous operation. Write for Bulletin EDJ-1019-A — or arrange to see the Pulp Master in action on your own stock.



E.D. Jones

PULP-MASTER

E. D. JONES & SONS COMPANY • PITTSFIELD, MASS.
BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

I. B. P. Reelects P. L. Phillips

ALBANY, N. Y. — Paul L. Phillips was reelected president of the International Brotherhood of Papermakers at a meeting held on December 4. He received 16,559 votes while his opponent, Matthew J. Burns, polled a total of 8,543 votes.

OBITUARIES

William A. McKee, former owner of the Litchfield Paper Co., Frankfort, N. Y., died December 20. He was connected with the pulp and paper industry for many years and at one time was mill superintendent of the Hinckley Fiber Mill. Surviving are his widow, a son and a daughter.

Annie Dean Knowlton, 84, president of the M. D. Knowlton Co., paper box machinery manufacturers, died December 21. She succeeded her brother, Col. Frederick K. Knowlton, as head of the company following his death in 1939. Her father, Mark D. Knowlton, founded the paper box machinery business in 1888.

Fletcher P. Thornton, vice-president and director of Stowe-Woodward, Inc., and with that company for 29 years, died at his home in Summit, N. J., on December 18. Mr. Thornton was a pioneer in the industry and before going to Stowe-Woodward was connected with Boston Belting Co. Surviving are his widow and three sons, Fletcher P., Jr., Capt. James S. and Peter Thornton.

AMERICAN PAPER AND PULP ASSOCIATION'S PAPER PRODUCTION RATIO REPORT

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1949		Corresponding Weeks—1948	
November 12	99.9	November 13	99.6
November 19	98.5	November 20	99.4
November 26	95.1	November 27	93.0
December 3	100.2	December 4	95.4
December 10 (Revised)	100.5	December 11	98.2
December 17	98.0	December 18	96.1

COMPARATIVE MONTHLY SUMMARIES

1948						1949	
Jan.	100.1	May	100.5	Oct.	99.1	Jan.	94.6
Feb.	99.8	June	95.7	Nov.	97.1	Feb.	92.8
Mar.	100.8	July	85.3	Dec.	87.1	Mar.	89.1
Apr.	100.8	Aug.	96.8			Apr.	85.1
		Sept.	91.8	Year Avg.	96.2	May	82.7
						June	78.6
						July	72.8
						Aug.	‡88.0
						Sept.	‡90.3
						Oct.	‡98.0
						Nov.	‡98.4

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1942	1943	1944	1945	1946	1947	1948	1949
Year to Date	90.7	88.1	88.6	89.9	101.6	104.9	97.1	88.9
Year Average	90.4	87.8	88.1	89.4	101.1	104.3	96.2	

PAPERBOARD OPERATING RATIOS†

Current Weeks—1949		Corresponding Weeks—1948	
November 12	94	November 13	96
November 19	94	November 20	97
November 26	90	November 27	89
December 3	93	December 4	93
December 10	96	December 11	96
December 17	92	December 18	96

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1948	99	100	102	102	100	94	81	92	91	96	94	84	95
1949	88	85	79	79	78	75	64	86	87	94	93		

* All of the above data is based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

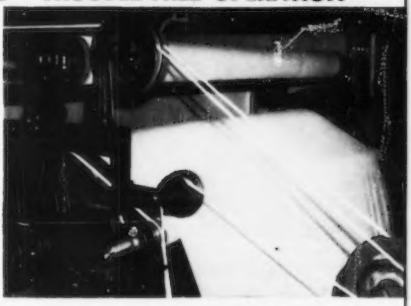
† Per cents of operation based on "Inch-Hours" reported to the National Paperboard Association.

MR. PAPER MAKER:

YOU TOO CAN PROFIT FROM WRINKLE-FREE — TROUBLE-FREE OPERATION

with...

Mount Hope



FREE WHEELING EXPANDERS!

More and more paper makers are becoming aware of the outstanding advantages of the Mount Hope Free Wheeling Expander.

1. Eliminates wrinkles and creases.
2. Maintains maximum width of paper.
3. Assures trouble-free operation — the free turning roll prevents paper spoilage and eliminates costly waste.
4. All ball bearing mounted neoprene sleeve.

TODAY — send for bulletin EPZ for complete details, prices. No obligations.

MOUNT HOPE MACHINERY COMPANY, 42 Adams St., Taunton, Mass., U. S. A.

MOUNT HOPE FREE WHEELING EXPANDER

COVERS • LABELS •
AND SPECIALTY PAPERS • NEWSPRINT
BUILDING PAPER • PAPERBOARD
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• GROUNDWOOD PRINTING AND
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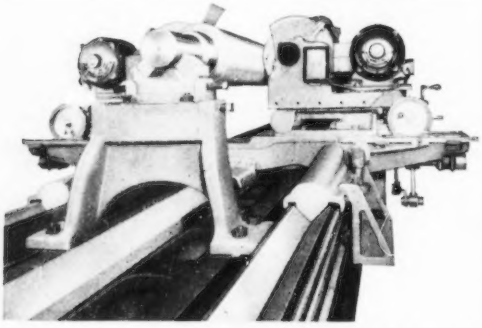
PAPERBOARD
Since 1903
LINDSAY HAS MADE
QUALITY WIRE CLOTH
FOR THE MANUFACTURERS
OF PAPER

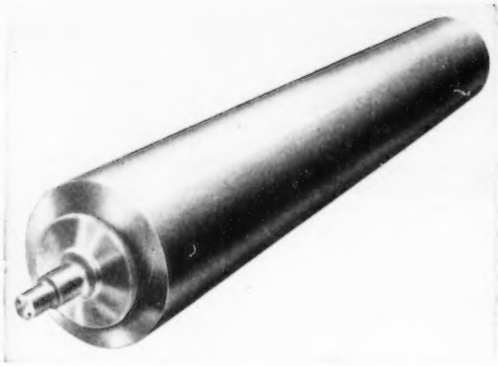
THE LINDSAY WIRE WEAVING COMPANY
14001-14299 Aspinwall Avenue • Cleveland 10, Ohio



FOR GRINDING COUCH, PRESS AND OTHER ROLLS . . .

The LOBDELL #5 GHV ROLL GRINDER will do it faster . . . with closer tolerance accuracy and higher degree of finish on the face of your rolls. In reconditioning such rolls, this improved LOBDELL ROLL GRINDER will greatly reduce your cost and save you valuable time. Write for complete specifications.

LOBDELL-UNITED CO.
SUBSIDIARY OF UNITED ENGINEERING & FOUNDRY CO
WILMINGTON 99, DEL.



McBRIDE brings you a *Complete* ROLL *Service*

PRODUCTION: Modern production facilities for large and small rolls of all types in metal, wood, and rubber covered.

ENGINEERING: McBride engineers work with you to solve individual roll problems, then supervise production to assure rolls that meet your exact needs.

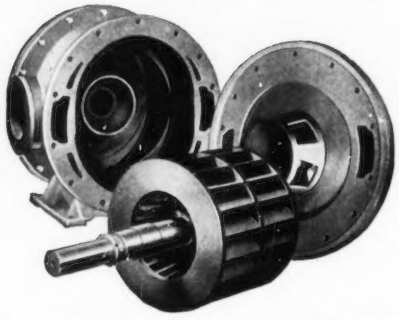
MAINTENANCE: A special department for maintenance and repair work is your assurance of prompt, top quality work.

Table Rolls	Couch Rolls	Stainless Steel Rolls
Wire Carrying Rolls	Press Rolls	Wood Rolls
Felt Carrying Rolls	Brass Rolls	Repairs to Rolls

Mc BRIDE

Edward J. McBride Co., Inc. • 1394 Adams Ave., Phila. 24, Pa.
ROLLS OF ALL TYPES FOR EVERY PURPOSE

SIMPLICITY



NASH VACUUM PUMPS HAVE ONE MOVING PART

Operating advantages made possible by the Nash principle, and present in no other type of vacuum pump, permit a new level of operating economy. Nash Vacuum Pumps have but one moving part, a rotor cast in one piece, and revolving without metallic contact. There are no valves, no pistons or sliding vanes, no internal parts requiring wear adjustment or lubrication.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A.

CLEARING HOUSE

HELP WANTED

WANTED

Superintendent for 1 machine mid-western mill making high grade folding box board. Capable, seasoned man both cost and quality conscious, interested in permanent connections. Replies will be kept in full confidence. Box No. 49-597 care Paper Trade Journal. NC

SALARIED POSITIONS $3,500—$35,000

If you are considering a new connection communicate with the undersigned. We offer the original personal employment service (40 years recognized standing and reputation). The procedure, of highest ethical standards, is individualized to your personal requirements and develops overtures without initiative on your part. Your identity covered and present position protected. Send only name and address for details.

R. W. BIXBY, INC.
117 Dun Bldg., Buffalo 2, N. Y.
TF

WANTED—Mechanical engineer for plant layout, machine design and process engineering, capable of design and drafting work. Permanent position with advancement for qualified man. Paper or board mill experience desirable but not essential. Give complete information in first letter including references and salary requirement. Address Box 49-532 care Paper Trade Journal. D-29

SALESMAN FOLDING BOXBOARD

Excellent opportunity offered to fully experienced man with following. Earnings unlimited.

Our mill is located in the midwest and produces all grades from plain chipboard to highest grades folding boxboards and cylinder kraft.

In reply give age, experience and full details.

Address Box 49-610 care Paper Trade Journal. D-29

SUPERINTENDENT for one machine board mill in the east. Unusual opportunity for capable papermaker having experience in high grade specialty boards and patent coated specialties. Some sales experience desirable but not essential. State age, experience, qualifications and salary expected. Replies will be held strictly confidential. Address Box 49-602 care Paper Trade Journal J-12

ADJUSTER—Paper Bag Machines, Potdevin and Lockport flat, square, sack, New York City. Excellent opportunity. State experience. Address Box 49-542 care Paper Trade Journal. D-29

HELP WANTED

MEN WANTED
POSITIONS OPEN

Controller $10,000-$12,000 year; paper mill executive for special position in connection with bleached pulp paper products, should be graduate chemical engineer and have paper manufacturing experience, splendid salary; sup. cylinder board mill; asst. sup. Fourdrinier kraft specialty paper mill; night foreman cylinder board mill; day supt. cylinder machine tissue mill; chemists and chemical engineers; machine tenders and back tenders.

Mechanical engineers and mechanical designers; designing draftsman paper converting semi-automatic machinery; chief draftsman pulp and paper mill machinery; supt. shipping and receiving, rags, waste and similar products; salesman with or without college education to sell paper mill chemicals; cylinder machine foreman.

We invite correspondence (confidential) with mills seeking executives and with executives seeking new positions.

CHARLES P. RAYMOND SERVICE, Inc.
294 Washington St., Boston, Mass
D-29

ELECTRICAL ENGINEER

Fox River Valley (Wis.) paper mill wants electrical engineer experienced in all phases of maintenance and layout. Give complete personal and business history in letter of application. Write Box 49-622, care Paper Trade Journal. J-19

Wanted for New England, Southern States and Middle Western territory representatives to sell imported paper machine wires apply with full particulars as to age and experience to Box 49-624 care Paper Trade Journal. D-29

Engineers—Executives—Technical Men
Salaried Positions
$4,000—$30,000

This confidential service for men who desire a new connection will develop and conduct preliminary negotiations without risk to present position. Send name and address for details.

TOMSETT ASSOCIATES
1209 Berger Bldg., Pittsburgh 19, Pa.
D-29

PAPER BAG MACHINE ADJUSTOR for New York Plant. Thoroughly experienced on POTDEVIN self opening machines. Salary $80. Give full details. Address Box 49-598 care Paper Trade Journal. D-29

HELP WANTED

WANTED FOR NEW MILL starting in the South: 3 Fourdrinier Machine Tenders for machine using pickup felt—4 Cylinder Machine Tenders for 10½ tissue and waxing. Address Box 49-623 care Paper Trade Journal. J-5

ASSISTANT TO GENERAL SUPERINTENDENT — Four machine tissue mill. Fox River Valley, Wisconsin. Machine experience required. Address Box 49-614 care Paper Trade Journal. J-19

SITUATIONS WANTED

TECHNICAL EXECUTIVE — Aggressive young man with 18 years background in research, practical papermaking, board and production management, is seeking midwest mill connection requiring responsible and intelligent assistance. Address Box 49-604 care Paper Trade Journal. J-5

FOREMAN of small varied bag specialty plant, long experience, technical background, complete know how, desires change with heavy responsibilities. Address Box 49-615 care Paper Trade Journal. J-19

FOR SALE

50", 64" & 72" BOARD PASTERS—FOR SALE
(With or without Paper Lining Stations)

COMBINES FROM ROLLS of 3 or more Plys, all types of Board (Chip, News, Kraft, Bristol, etc.)—producing various sheet dimensions and finished calipers. New and/or Rebuilt Stations consist of: ROLL STANDS, GLUE STATIONS, PRESS ROLLERS, SLITTER STATIONS, CUT-OFF KNIFE & CONVEYORS—all of standard makes and "on hand" for prompt delivery. We install, guarantee and instruct operations. Box 49-567, care Paper Trade Journal. TF

CURRENT OFFERINGS

58" Finley Single Knife Sheeter.
82" Hamblet Sheeter with Layboy.
No. 9 Cameron Slitter.
3-color Rotary Web Press, 60" cyl.
55" 9-roll Super Calendering Machine.
Model 145 Economy heavy duty Baler.
32", 38", 40" and 44" Power Cutters.
NEW Back-Stands, made to special order.
Motors—from fractional to 30 H.P.

THOMAS W. HALL COMPANY, Inc.
120 West 42nd St., New York 18.
(Plant at Stamford, Conn.)
TF

RATES FOR CLASSIFIED ADVERTISING

HELP WANTED—10c a word. Double rate for heavy face type. Minimum charge $2.50.

SITUATIONS WANTED—10c a word, double rate for heavy face type. Minimum charge $2.50. If repeated ½ rate will be charged for each consecutive repetition.

FOR SALE—10c a word. Double rate for heavy face type. Minimum charge $2.50.

WANTED—10c a word. Double rate for heavy face type. Minimum charge $2.50.

OPPORTUNITIES—10c a word Double rate for heavy face type. Minimum charge $2.50.

Classified advertising space may also be purchased at $5.00 per single column inch. All classified advertisements are payable in advance. If box number is used—70 cents additional.

Address replies to advertisements appearing under Box Numbers in care of PAPER TRADE JOURNAL, 15 West 47th Street, New York 19, N. Y.

FOR SALE

FOR SALE

1—P & H MODEL 855-B CRANE G.M. DIESEL POWER. KOHLER ELECTRIC LIGHT PLANT, 70 FOOT BOOM. MACHINE NEW IN 1946 AND HAS HANDLED ONLY PULPWOOD IN ONE LOCATION. SPLENDID CONDITION.
1—HAYWARD 5/8 CORD PULPWOOD GRAPPLE—NEW.
2—OWENS NO. 96 R.C. 5/8 CORD PULPWOOD GRAPPLES.

Write Box 49-605, care Paper Trade Journal. J-5

FOR SALE

FOR SALE

1—Kidder Spot sheet cutter, 5 feet delivery, 48 inch width. Sheet length 20 inch to 36 inch. Complete with Layboy and Backstand. Good condition.
1—80" Cameron Rewinder, Type 10, Machine No. 25615. Slits and rewinds to 30" diam.
1—54" Cameron Rewinder, Type 9, Machine No. 62350. Slits and rewinds to 24" diam. Now in continual operation. Good condition.

Address Box 49-619 care Paper Trade Journal. D-29

FOR SALE—One—5 ft. x 8 ft. Impco Vacuum Sludge Filter, new in 1941. Frank H. Davis Company, 175 Richdale Avenue, Cambridge, Massachusetts. J-19

FOR SALE

FOR SALE

Paper Mill with 2 Fourdrinier Machines complete with auxiliary equipment. Designed for 60 tons of Specialties, News, Book, Toweling, Kraft etc. Can be put in operation immediately. 80,000 Sq. Ft. Buildings, fully sprinklered, Railroad Siddings, excellent water. Two H.P. stoker fired water tube boilers installed in 1956. Excellent labor conditions. All located within trucking distance New York, Philadelphia, Baltimore, Washington. Immediate possession. Attractive proposition. Terms to responsible party.

OSBORNE PAPER MILL CO.
Fulton, N. Y.

D-29

FOR SALE—Model B Cleveland Folder with suction pile feeder, new 32 page attachment, and A.C. Motor. Wonderful outfit. Address Box 49-613 care Paper Trade Journal. J-5

FOR SALE

1—Plain Extractor Roll 28" diameter x 150" face.
1—112" Cameron Type 18.

BARKERS
1—5' Carthage Disc Barker

BEATERS
1—600 lb. Beater—iron tub

BEATER (Laboratory)
1—Dilts Iron Tub Laboratory Beater. Beater roll 14" diameter x 10½" face, including motor.

BRASS FELT ROLLS
9—4" diameter x 140" face (with bearings)

BREAST ROLLS
1—120" x 14".
1—100" x 14".
3—114" x 14".

CALENDER STACKS
1—72" 5 roll Calendar Stack.
1—76" 7 roll calender stack (heavy duty).
1—2 roll pressure calender—32" x 108".
1—2 roll Calender Stack—16" diameter x 50" face.

CHIPPERS
2—96" Murray 4 knife Chippers.

CORE CUTTERS
1—Core Cutter.

CRUSHER & HAMMERMILL
1—Murray Chip Crusher.
1—Jeffrey Hammermill.

CYLINDER MOULDS
1—36" diameter x 80" face.
1—39" diameter x 72" face.
1—36" diameter x 79" face.

DECKERS
1—Decker—48" diameter x 84" cylinder mold
3—Pusey & Jones Deckers Cylinder molds 42 x 146, anti friction bearings, including rubber covered couch rolls.
3—IMPCO 75½" face x 30" diameter cylinder mold.

DRIVES
2—#4 Reeves Drives.
1—#2 Reeves Drive.
1—Smith & Winchester mortise gear Drive.
1—Foote—7½ h.p. Speed Reducer (Ratio 240 to 1)
2—Smith & Winchester Mortise Gear Drives with 20" diameter clutches—Ratio 8 to 1.
6—Enclosed drives. 75 h.p., ratio 8 to 1. Complete.
1—#5 Reeves drive.

DRIVES (Angle)
1—General Machine Company 16 : 1.
1—Philadelphia 30:1 — 1 h.p. — 1200 r.p.m.
3—Philadelphia 21¼:1 — 3 h.p. — 1200 r.p.m.

V-BELT DRIVE
1—21½" diameter x 7½" face, 5 groove.
1—16½" diameter x 7½" face, 5 groove. (With clutch).

DRYERS
30—36" diameter x 102" face.
7—24" diameter x 48" face.
9—36" diameter x 72½" face, with gears and bearings.
1—48" diameter x 91" face.
2—25" x 120" (Baby Dryers).
2—36" x 143".
1—24" x 130".
1—60" diameter x 47" face.
3—36" diameter x 96½" face.
1—48" diameter x 70" face.
2—48" diameter x 92" face.
1—48" diameter x 82" face.
2—36" x 76" face.

EMBOSSER
1—84" Hudson Sharp Toilet Embosser. Spare engraved roll.

FELT ROLLS
20 Felt Rolls—Brass covered 8" to 12" diameter.

FLAT SCREENS
1—6 plate Shartle Flat Screen
2—12 Plate Murray Dunbar Flat Screens
6—12 plate IMPCO Flat Screens with Dunbar Drives.

FRAMES
Vertical frames for 85 42" dia. dryers—with bearings.

FRICTION CALENDERS
2—30" Waldron.
2—38" Waldron.

HYDRAULIC PRESS
1—Watson-Stillman Co. (Platen 24" x 24").

JORDANS
2—Noble and Wood—Mammoth Type.
1—Emerson Jordan—25 to 30 tons capacity—iron plug including new spare iron plug.

MISCELLANEOUS
1—Caustic Mixer.

MOTORS
2—5 h.p. ball bearing—splash proof motors—3/60/440. 1160 r.p.m.
1—½ h.p. ball bearing—splash proof gearhead motor—3/60/440. 1725 r.p.m.
1—2 h.p. ball bearing—splash proof gearhead motor—3/60/440. 1725 r.p.m.

PRESSES
4 Sections of presses approximately 24" diameter. Rubber and Bronze.

PRESS ROLLS
Various sizes.

PRINTING MACHINE
1—3 color 40" Rotary Cottrell Printing Machine, A-1 condition, provision for 2 more colors.

PULLEYS
Various cone and assorted pulleys.

PULPERS
1—Jones Pulper. Complete with motor and drive.
1—Noble & Wood Pulper—Iron Tub.

PUMPS
2—Weil Pump Co.—100 g.p.m.—100 P.S.I. including 15 h.p. motors (new equipment).
1—Bell & Gossett—300 g.p.m.—120' head—including 15 h.p. motor.
1—Goulds Sump Pump—50 g.p.m.—20' head—including motor.
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

REEL
1—72" Beloit Reel.

ROLLS
800—Brass tube-steel tube—rubber covered iron rolls—various sizes

ROTARY SCREENS
1—#2 Bird Rotary Screen.
1—#2A Bird Rotary Screen.

SAVEALLS
1—Saveall—48" diameter x 84" cylinder mold.
3—Pusey & Jones Savealls. Cylinder molds 42 x 146, anti friction bearings, including rubber covered couch rolls.

SCREEN PLATES
20 Plates cut .010.
10 Plates cut .008.
Also other sizes and cuts in stock

SHEETER
1—136" Moore & White Sheeter, duplex, with layboy.
1—74" Downingtown Duplex.

SLITTERS AND WINDERS
1—50" Cameron—Type 24-2L.
1—42" Cameron—Type 40-4-B.
1—42" Cameron—Type 24-2.
1—42" Cameron—Type 9-5.
1—42" Cameron Constant Tension with pneumatic control
1—115" 2 drum Waldron
1—72" Cameron—Type 10-5.
1—72" Cameron—Type 10-2.

SQUEEZE ROLL
1—Rubber Squeeze Rolls, 20¾" diameter x 102" face.

STOCK PUMPS
1—10 x 20 Shartle Duplex.
2—7 x 16 Sartle Duplex.
3—7 x 16 Shartle Triplex.
Numerous other Centrifugal Stock Pumps Advise us to your requirements.

SUCTION BOXES
5—Suction Boxes, 82" drilled face x 6" wide.

SUCTION COUCH ROLL
1—24⅞" diameter x 160" drilled face.
1—Sandusky 14⅞" diameter x 103" drilled face.

SUCTION PRESS ROLL SHELL (Only)
1—29¼" diameter x 134" drilled face.

SUPERCALENDER STACK
1—54" 9 roll supercalender stack, completely rebuilt including motors, etc.

TABLE ROLLS
40—Table Rolls 82" face x 3" diameter.

TOILET and TOWEL MACHINES
2—Dietz 81" Toilet & Towel Machines.

TRIMMER
1—56" Smith & Winchester—Undereut.

TUNNEL DRYERS
2—Proctor & Schwartz Tunnel Dryers, 10 ton and 5 ton capacity.

TURBINE
1—150 h.p. Westinghouse Type C-Gear Turbine (Recently rebuilt).

VAT
1—Iron end Vat only, for decker or saveall, suitable for cylinder mold 36 x 130.

YANKEE DRYERS
1—8 diameter x 156" face
3—Yankee Dryers 84" diameter x 52, 53 and 62" face

WAXING MACHINE
1—72" Mayer Waxer.

We are always in the market to purchase your surplus or idle machinery. What have you to offer?
Wanted Cylinder and Fourdrinier Machines (complete mills).

Paddy Ross, Pres. **J. J. ROSS COMPANY** **Ben Kurs, Treas.**

250 Frelinghuysen Ave. **Tel.—Bigelow 3-3720** **Newark 5, N. J.**

TELEPHONE HUMBOLDT 2-2177

CABLE ADDRESS: JACKROSS

ROSS PAPER MACHINERY CO.

265 PASSAIC STREET
NEWARK 4, N. J.

CONVERTING PAPER MAKING EQUIPMENT

NEW, USED, REBUILT PAPER AND PULP MACHINERY

AMERICA'S LARGEST BUYERS OF PAPER MAKING MACHINERY

ANILINE PRESS
1—Lockport 4 color Aniline Press.

BEATERS
2—Valley Iron 750 lb. Iron Tub—Bronze filled.

BLOWERS
8—Blowers and Mill Exhausters

CALENDER ROLLS
46 Chilled Iron Rolls—Assorted sizes.

CALENDER STACKS
1—104" face 5 roll stack, with drive
1—76" face 7 roll with drive.
1—76" face 3 roll with drive.
1—112" face 7 roll.
1—82" face 5 roll Sandy Hill.

CONVEYOR
1—18½ ft long x 30" wide—with motor.

CYLINDER MOLDS
6—IMPCO 10" diameter x 84" face
1—36" diameter x 136" face Cylinder molds with vats, couches—ball bearing.
2—74" face x 36" diameter.
1—134" face x 36" diameter, with stainless steel shafts.
1—78" face x 30" diameter.

DRIVES
1—62" Reeves Drive, 40-50 h.p.—Ratio 4 to 1.
1—Falk 60 h.p. Ratio 13 to 1, R.p.m. 1470-113. Herringbone gears.

DRYERS
1—74" face x 28" diameter with gears.
5—143" face x 48" diameter.
6—124" face x 48" diameter.
3—80" face x 36" diameter.
1—77" face x 48" diameter—with gear.
1—64" face x 36" diameter.
18—78" face x 36" diameter, complete with 2 deck frames, gears, bearings and steam joints. Drives, line shaft and felt rolls are available.
1—78" face x 18" diameter with gears and bearings.
1—120" face x 16" diameter—Baby Dryer.
6—96" face x 48" diameter.
95—126" face x 42" diameter.

ELECTRIC PAPER MACHINE DRIVES
1—G. E. 55/110 with G. E. Generator, Exciter and Controller.
1—G. E. 80/100 with G. E. Generator, Exciter and Controller.

EXTRACTOR ROLLS—SUCTION
1—Downingtown—64" face x 17" diameter with bearings & stand.

FLAT SCREENS
1—Montague 6 plate—ball bearing.
1—Sandy Hill 8 plate.

FOURDRINIER SECTIONS
1—P & J 156" x 80 ft. ball bearing. Complete from inlet to 22" diameter suction couch. Brass and Rubber covered table rolls. 6 Brass Suction Boxes operated at 1000' per minute.
1—M & W 82" x 49' complete with 3 suction boxes, shake, 3 section presses and size press.

HEAD BOXES
1—118" Bronze Lead Lined. Beloit.

INLETS
1—Voith Inlet for 151" wire with 28" slice. Complete, including drive.
1—96" All bronze—adjustable.
1—141" Beloit complete with distributor roll.

JORDANS
2—Jones Standard.
1—23 Miami, for motor drive.
1—Jones Majestic, roller bearing—stainless steel filling—for motor drive.
4—Jones Majestics with base and couplings—bronze filled, 2 sets of new bronze fillings
2—23 Appleton with base and coupling—bronze filled.
1—Dillon Horse 22—direct connected 75 h.p. Stainless steel ¼" filling.
1—22 Smith & Winchester—Ball bearing.

LABORATORY EQUIPMENT
1—Cavagnaro 2 roll 12" calender. Steam fitted rolls.
1—16" Coating Machine.

MOTORS
1—Fairbanks Morse — 20 h.p. — 485 r.p.m. — 220/440/3 ph.—60 cycle.
1—Reliance 25 h.p. ball bearing, 850 v., 3 phase, 60 cycle—1750 r.p.m.

PULLEYS
30—Split cast iron tapered Pulleys.

PULP EQUIPMENT
1—Jigger—1 deck—vibrating screen.
1—Mitts & Merrill 217 Pulpwood chipper
1—4" Carthage Disc Barker
1—96" Murray 4 knife ball bearing Chipper, with 150 hp synchronous motor.

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2—22 Lamoyne Pulpers—with drives.

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44—Centrifugal Pumps, open & closed Impellers. Direct connected or Belt Driven. Extended base for motor. Assorted capacities and heads. Most used less than one year. Also new Goulds Pumps.

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1—Beloit 132" two bowl upright reel.
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32—Press rolls, brass and rubber covered.
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2—Jones Leitwalk—cylinder 64" face x 28" diameter.
1—22 Leith-walk-ball bearing.
1—23A Bird with motor. Used less than 1 year.

SCREW PRESSES
2—Valley Voith Screw Presses Size 2A, with new spare sets of plates.

SHEETERS
1—Beloit Duplex 104", complete with drive.
1—Hamblet Duplex—136".
1—Hamblet 12 roll heavy duty doubledeck backstand.
2—Moore & White 106" single knife with layboys and 6 roll backstand.
2—Moore & White 62" single knife with layboys and 6 roll backstand.
2—Moore & White 48" single knife with layboys and 6 roll backstand.
3—Hamblet 67" single knife with 8 roll backstand.

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1—American 37" Hammermill, anti-friction bearing.
2—Sprout Waldron Cutters—type F-11—30" knives. Used 30 days.

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2—Pusey & Jones 160" high speed slitters and rewinders.
1—New 50" Cameron Model 6.
1—Beloit 2 drum 125" with 8 slitters.

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1—Shartle 8½x12 Triplex—Silent Chain Drive.

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1—Millspaugh 22" diameter x 138⅝" suction face
1—Millspaugh 22" diameter x 158" drilled face.
1—Beloit 107" drilled face x 22" diameter. Anti friction bearings.
1—Millspaugh—141½" diameter x 93" drilled face.

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1—Downingtown 25" diameter x 180" drilled face.
1—Beloit 22" diameter x 105" drilled face for direct drive. Anti friction bearings.

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1—7 roll 69" face.
1—7 roll 56" face.
1—Norwood 74" 7 roll with motor and controls.
1—Norwood 72" 7 roll with motor and controls.

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1—72" Thickener—all iron vat.
1—88" Thickener—new wood vat.

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1—64" Seybold Precision with motor and five spare knives.
1—Seybold 74" with motor and five knives.

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1—GLASSINE SUPER CALENDAR STACK with 14 57" face rolls (8 rolls paper 13"—4 rolls steel —9"; 1 roll steel—16"; 1 roll steel—18") with 1 dampener with 60" rolls.

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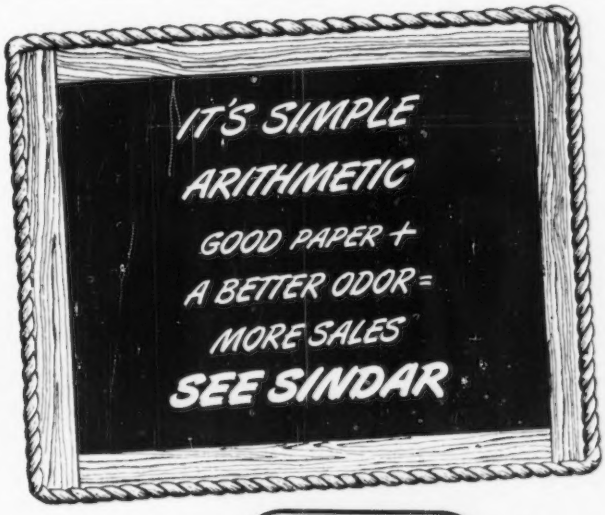

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Swenson Evaporator Co., Div. of Whiting Corp.

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Ross Engineering Co., J. O.
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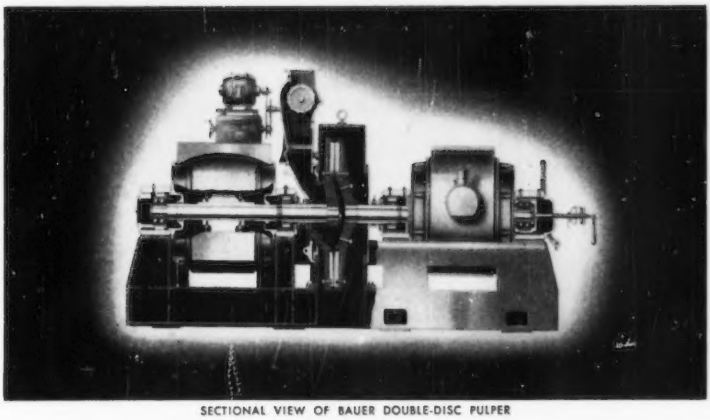
Mt. Vernon-Woodbury Mills, Inc.
Morey Paper Mill Supply Co.
Orr Felt & Blanket Co.
Shuler & Benninghofen
Waterbury Felt Co.
Waterbury, H., & Sons Co.
Williams-Gray Co.



SECTIONAL VIEW OF BAUER DOUBLE-DISC PULPER

Bauer PULPER

PRODUCES LONG FIBERS

The Bauer machine makes a desirable pulp for liner because it brushes and works upon the diameter of the fiber rather its length.

This quotation is from an article describing the equipment in a pulp and board mill. It emphasizes a characteristic of the Bauer Pulper; viz., the production of long fibers.

Bauer Pulpers are used for processing raw, steamed, and cooked chips from soft and hard woods; groundwood rejects; sulphite and soda pulps; kraft knotter and screen rejects; waste paper of all kinds; bagasse, licorice root, and bamboo fibers; straw and many other agricultural residues.

Ask for complete information. If you have special pulping and refining problems, you are invited to utilize our laboratory facilities.

The BAUER BROS. CO., Springfield, Ohio

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3 PHASE, 60 CYCLE

Sleeve bearing, open—except as noted

H.P.	MAKE	Type	Volts	Speed
200	Westg.	CS	2300	1200
200	Westg.	CS-956A	2300	900
200	G.E.	K	2300	720
200	Westg.	CS-32B	440	720
200	Westg.	CS-950A	440	600
200	G.E.	IK-15A	440	450
150	Westg.	CS-771-1C	440	1750
150	Westg.	CS	2200	1200
150	Cont.	TEFC NP-743K	440	900
150	Westg.	CS-950A	440	600
150	G.E.	K-564	2300	600
125	Westg. BB	CS	440	3600
125	G.E. TEFC	K-6326S	440	1200
125	G.E.	IK	2300	1200
125	Al. Ch. BB	AR-826DS	440	1200
100	G.E.	KT	2300	1800
100	Burke	EM-12.5	220	1200
100	U.S. Vert.	CFU-994A	220/440	1200
100	Al. Ch. BB	ARZ-826	440	900
100	G.E.	K-6333	440	720
75	Al. Ch.	AR-223-BS	2200	1800
75	Al. Ch. BB	AR-505	220/440	1200
75	Al. Ch.	AR	440	1200
75	G.E. TEFC	K-505	220	1200

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Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Waldron Corp., John

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Vanderbilt Co., R. T.
Witco Chemical Co.

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Hungerford & Terry, Inc.
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Moore & White Co.
J. O. Ross Engrg. Corp.
Witco Chemical Co.
Walworth Company

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Walworth Company

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Koppers Company, Inc.

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Norton Co.

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Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Westinghouse Electric Corp.

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Goldell Co.
Norton Company
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Leeds & Northrup
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Red-Ray Mfg. Co., Inc.
Ross Engineering Corp., J. O.
Stickle Steam Specialties Co.
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The Brown Instrument Co.
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Cochrane Corp.
The Foxboro Company
General Electric Company
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Leeds & Northrup Company
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B. F. Perkins & Son
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Williams Apparatus Co., Inc.

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Perfecting Service Corp.

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Shartle Brothers Machine Co.
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Valley Iron Works Co.

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Leeds & Northrup Company
National Technical Laboratories

Taylor Instrument Companies
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Valley Iron Works Co.

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Dilts Machine Works.

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General Electric Company
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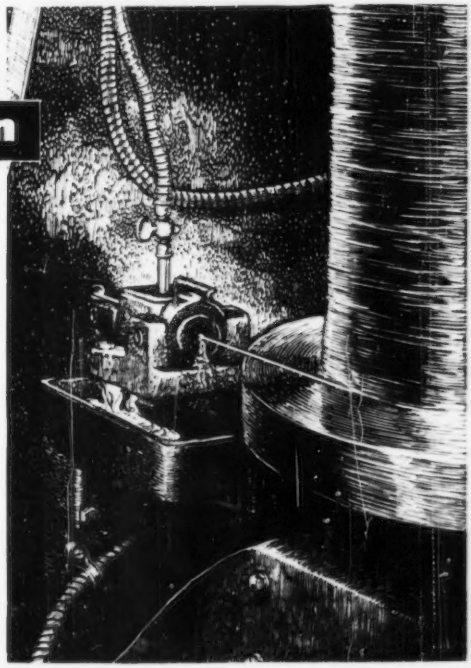

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Stickle Steam Specialties Co.
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The Dow Chemical Company
The Goodyear Tire & Rubber Company
Hercules Powder Co.
Monsanto Chemical Company
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Pusey & Jones Corp.
J. J. Ross Company
Ross Paper Machy. Co.
Rodney Hunt Machine Co.
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Shartle Brothers Machine Co.
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Moore & White Co.
Potdevin Machine Co.
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ROTARY STEAM JOINTS
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The Moore & White Co.
Perfecting Service Corp.

RUBBER PRODUCTS
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Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

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Hardinge Company

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Merrick Scale Mfg. Co.
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Fitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Testing Machines, Inc.

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Appleton Machine Company
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Shartle Brothers Machine Co.
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Monsanto Chemical Company
National Aluminate Corp.
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General Dyestuff Corp.
Monsanto Chemical Co.
National Aluminate Corp.
Rohm & Haas Co.
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Dietz Machine Works
Dilts Machine Works
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Gibbs-Brower Company, Inc.
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Hamblet Machine Co.
Hudson Sharp Machine Co.
Langston Co., Samuel M.
Moore & White Co.
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Potdevin Machine Co.
J. J. Ross Company
Ross Paper Machy. Co.
The Sandy Hill Iron & Brass Works
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Waldron Corp., John

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Davis Engrg. Corp.
Johnson Corp.
Perfecting Service Corp.
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

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Carnegie Illinois Steel Co.
Lukens Steel Company
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
U. S. Steel Corp.

STEEL, CLAD

Babcock & Wilcox Co.
Lukens Steel Company

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Moore & White Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

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Moore & White Co.
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Shartle Brothers Machine Co

SUCTION UNIT

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Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS

Valley Iron Works Co.

SULPHUR DIOXIDE

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Virginia Smelting Co.

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Nopco Chemical Co.

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Dilts Machine Works (Kohler System).

TALC

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Vanderbilt Co., R. T.

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Kalamazoo Tank & Silo Co.
The Noble & Wood Machine Co.
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J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Waldron Corp., John

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Testing Machines, Inc.

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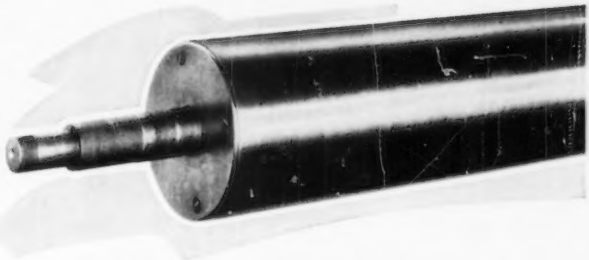
WELDCO



● America's leading pulp and paper mills use Weldco Monel-covered table rolls, for these steel rolls have high strength and stiffness . . . and twice as much sag-resistance as other types of rolls. Monel-covered rolls are carefully ground for accuracy and uniformity, are polished to a fine, smooth surface that reduces friction and keeps fibre and paper from sticking.

Shown here is a 6" diameter x 157" face table roll, covered with a 1/16" Monel sheet, with Monel end covers. One mill has had rolls of this type in service for 7 years, and reports no sagging or whipping, no corrosion or tendency to accumulate pitch. In addition, the rolls require very little cleaning, have high abrasion-resistance, show little wear on fourdrinier wires, and withstand acids and alkaline white waters.

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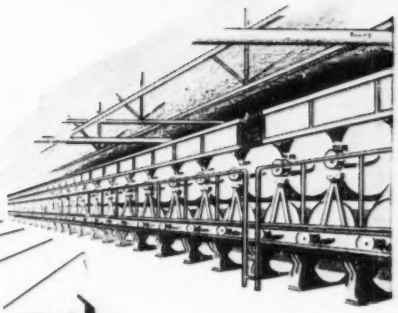
A simple chemical equation but a manufacturing headache...



$$2Cl_2 + 3Ca(OH)_2 = Ca(OCl)_2 + CaCl_2 + Ca(OH)_2 + 2H_2O$$

In the text book, the reaction between milk of lime and chlorine to make liquid bleach is simple enough. Just add chlorine to milk of lime and you've got liquid bleach. But how to do this safely, economically and uniformly, occupied the time and efforts of chlorine producers for a good many years after World War I.

Hooker paper technicians, chemists and engineers, contributed their services to this all-important project. They showed pulp and paper makers how to handle chlorine safely, how to get it into the milk of lime for more efficient production of high quality liquid bleach. The principle of the cone injector, widely used in pump circulation systems, was applied by Hooker engineers and proved an efficient method for securing more thorough mixing of chlorine and milk of lime.

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Hooker bulletins for the Pulp and Paper making industry contain helpful information. Send for a list of those available.

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